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THE

# ENTOMOLOGIST

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EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

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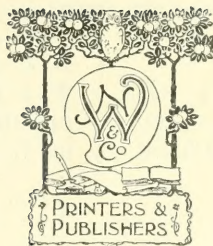
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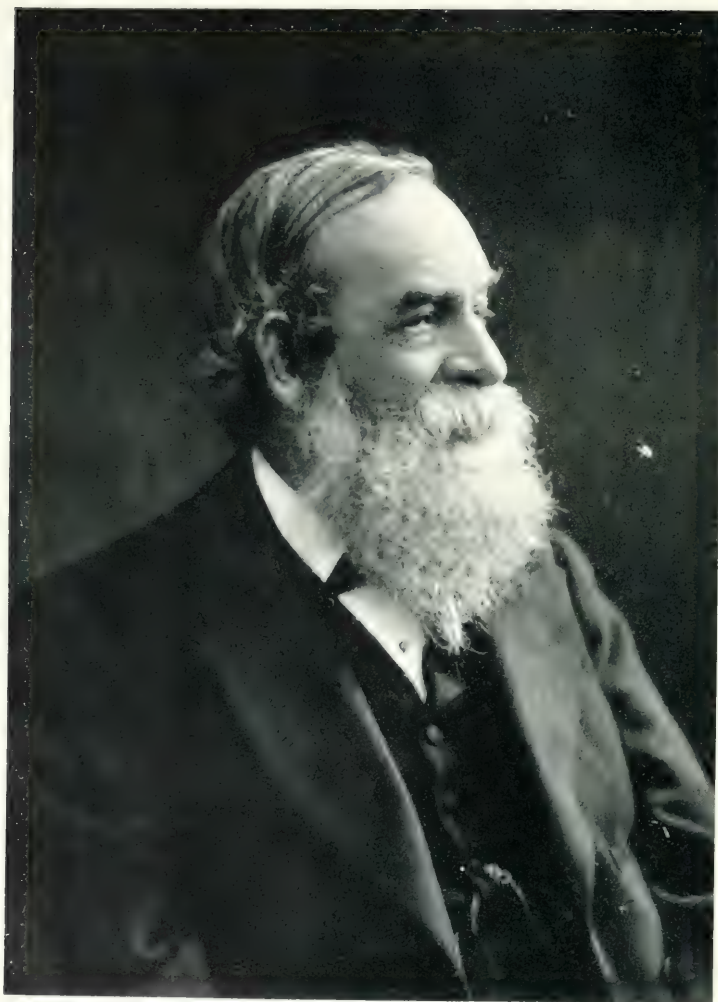


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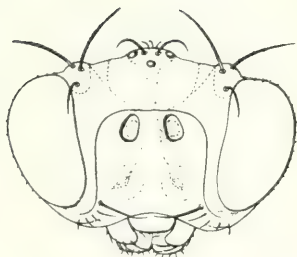
Believe me,  
Yours sincerely,  
W. F. Kirby







1



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J. E. C. del.

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Figs. 1-2-3. *PARYDROPTERA DISCOMYZINA*.

Figs. 4-5. *PHILYGRIA SEMIALATA*.

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## *PARYDROPTERA DISCOMYZINA* AND *PHILYGRIA SEMIALATA*; NEW PALÆARCTIC EPHYDRIDÆ (DIPTERA).

By J. E. COLLIN, F.E.S.

(PLATE II.)

A SINGLE specimen of a remarkable Ephydrid in the late Mr. Verrall's collection, bearing a locality label, "Rye, 25.5.02, W. Bennett," had always been a puzzle to me. I was therefore more than pleased to receive from Mr. Claude Morley, in July, and again in September, 1912, several specimens of the same fly, found by him at Southwold (Suffolk), where they occurred on the mud about the roots of the salt-marsh herbage. A study of these specimens convinced me that they must represent not only a new species but a new genus, which I propose to name *Parydroptera discomyzina*, because, though in many respects resembling a *Discomyza*, it has a *Parydra*-like venation.

### *PARYDROPTERA*, n. gen.

Belonging to the subfamily Notiphilinae, and distinguished from *Discomyza* by its less flattened shape, less concave back of head, more rounded ridge between back of head and vertex, by the smooth face without bristles, the only pubescent arista, the absence of the humeral bristle, by the fronto-orbital bristle pointing forwards, not backwards, the smaller mouth-opening and stouter base of proboscis, and by its *Parydra*-like venation.

### *Parydroptera discomyzina*, n. sp.

♂ ♀. A brownish-black species with head and thorax mottled with grey; wings with a very distinctive venation, and when at rest bent over at the tip and closely adpressed over the abdomen.

Head (figs. 2 and 3) broader than long or deep, in profile not much flattened, the jowls and back of head being wide and the face rounded. Eyes with very short scattered microscopic hairs. Frons much wider than long; vertical triangle large, rounded, and reaching forward to frontal margin, brown with a grey central stripe from front ocellus onwards, and a small grey patch at each side of ocellar triangle on the vertex; vertical and fronto-orbital bristles placed

upon a brown patch, but the frontal wedges dull blackish in most lights: the eye margin, from the fronto-orbital bristle to the dull blackish patch below the eye, is grey with a dull brown spot level with the frontal margin. Face grey like the eye margins, with a dull brown depression each side of the most prominent part at the middle. Back of head greyish about the middle above and on a stripe from about the middle of the side of head along lower half of eye margin past the dull blackish patch below the eye to the mouth edge, but brownish and with a row of minute bristles from the vertical bristles round to the middle of the back part of eye, and brownish with a few scattered bristles on the lower back part of jowls. Mouth-opening large, labrum and palpi grey, back part of proboscis stout, strongly chitinated and hairy, somewhat as in *Parydra* or *Pelina*. Antennæ grey with the third joint brownish, second joint with a weak spine above pointing forwards, but without the bristle pointing upwards and outwards so characteristic of all the rest of the Notiphilinae. Arista minutely pectinate above and inconspicuously hairy beneath about the base. Chætotaxy: Two ocellar placed close together at middle of ocellar triangle, the usual two vertical, one fronto-orbital pointing forwards, one vibrissa placed level with lower angle of eye, followed by four to five smaller bristles.

Thorax and scutellum brownish, the former roughly rugose, somewhat as in *Pelina ænea*, and with grey patches, of which two large ones in front are the beginning of indistinct stripes down the thorax, and smaller ones on each side (one in front and one behind the suture), form indistinct side stripes, in addition the humeri and notopleural suture are greyish; the upper part of pleuræ is brownish, the lower and hind part greyish; scutellum flattened and somewhat square shaped. Chætotaxy: Two notopleural, one postalar, one dorso-central right behind, four scutellar (the two basal ones placed well on disc), one small mesopleural, the sternopleural reduced to a fine hair; in addition, the brown part of disc of thorax and the mesopleuræ bear scattered short bristles.

Abdomen composed of five segments (of which the first two are short), brownish black, smooth and shining, the punctuation very fine, and the pubescence of short fine bristles, scattered; genitalia hidden beneath the last abdominal segment; ventral abdominal plates narrow, clothed with a few scattered hairs.

Legs brownish black with paler tarsi; front tarsi with the extreme base of first and second joints yellowish, middle tarsi yellow with the last one or two joints and the middle of the basal joint brown, hind tarsi like the middle ones, but the darkening is rather more extensive, and includes the middle of the other joints. Middle tibiæ with a short terminal spur beneath.

Wings (fig. 1), in life, lapped over one another with the tips bent down, closely following the contour of the abdomen; they are strongly veined, streaked with brown, and with a brown spot between the cubital and discal veins; radial vein short and with a curved veinlet near the tip, as in some species of *Parydra*; postical cross-vein curved and acutely sloped outwards. Squamæ blackish. Halteres brown with yellow stems.

Length, 2-2.25 mm.



The next species is remarkable in possessing abbreviated and narrow wings, but clearly belongs to the genus *Philygria*. I am indebted to Mr. J. Collins, of the Oxford University Museum, for the privilege of being able to examine and describe this species; he caught six specimens close to some sand-martins' burrows in a gravel-pit at Cumnor (Berks) on July 22nd, 1910.

*Philygria semialata*, n. sp.

♂ ♀. A small brownish species resembling *P. picta*, but with narrow and abbreviated wings.

Head both in shape and colour much resembling that of *picta*, except that the whitish grey eye margins of the frons are not so distinct; the third antennal joint is yellowish beneath and the arista pectinate above, almost exactly as in *picta*.

The dark brownish thorax has faint indications of the two whitish grey stripes of *picta*, and the lower part of pleuræ is distinctly grey, but the scutellum is the same colour as disc of thorax, though when viewed from behind there is a grey patch on each side beneath the basal bristle. Chaetotaxy as in *picta*, and differing from the rest of genus in having only two pairs of dorsocentral, and no acrostichal bristles.

Abdomen dull about base, more shining towards tip, but nowhere so brilliantly shining as in *picta*.

Legs dark yellow, with the knees, tips of tarsi, and end of front tibiae brownish, sometimes the front femora brownish above.

Wings (figs. 4 and 5) short, narrow, and curved, I believe always shorter and narrower in female than in male; venation somewhat variable, the postical vein sometimes rudimentary or continued half-way to wing margin (female), sometimes complete, and the postical cross-vein present (male). Halteres whitish yellow.

Length, 1-1.25 mm.

The shape of the head, the slightly pubescent eyes, and its chaetotaxy prove that this species must be placed in the same genus as *P. picta*, which I am inclined to think should be generically separated from *Philygria*.

Dr. Kertész, in 1910 ('Rovartani Lapok.' xvii. p. 182), has described a Hungarian species (*P. mocsaryi*), which also has abbreviated wings, but which evidently belongs to the other group of the genus having three pairs of dorsocentral and uniserial acrostichal bristles on the thorax; other differences exist in the dark antennæ, legs, and halteres, and in the maculated wings. It was found in heaps of stones near the snow at an altitude of 2000 m.

EXPLANATION OF PLATE II.

Fig. 1.—Wing of *Parydroptera discomyzina*, ♀, × 30.

Fig. 2.—Head of " " " " × 48.

Fig. 3.—Profile of head of *P. discomyzina* " " × 48.

Fig. 4.—Wing of *Philygria semialata*, ♀, × 40.

Fig. 5.— " " " " ♂, × 40.

ON REARING *PAPILIO MACHAON*.

BY E. E. BENTALL, F.E.S.

1910. Early in the year I purchased some Continental *Papilio machaon* pupæ to try a breeding experiment in my butterfly-house, which is a long greenhouse-like building covered partly with glass and partly with perforated zinc arranged in alternate squares, so that air and rain should have free access.

The house was planted with food-plants for larvæ and with flowering plants for butterflies.

The butterflies, having paired, commenced to lay early in June.

On June 15th, having found that the young larvæ which had hatched were being eaten by small spiders, I collected thirty-three that day and put them in leno-covered cages to protect them. I see by my notes that I found three hundred and fourteen between June 13th and July 5th. The whole of this first brood of larvæ were successfully reared, and in due time imagines emerged, some to be transferred to the butterfly-house and others were set free in the garden.

Those in the house paired and laid a quantity of ova, from which larvæ hatched and were brought up in cages as before. This second brood of larvæ commenced suspending on September 9th, and the whole of the pupæ hybernated with practically no loss.

1911. *P. machaon* commenced to emerge on May 12th, and were mostly males, but by May 24th chiefly females emerged. Many were let out into the garden. Of those retained in the house I put Continental males and females in one division of the house, and in another division I placed some English females and some Continental males. I wished to see whether they would pair as freely as the Continental of both sexes do. I found they were quite as ready to do so. In the compartment reserved for the mixed breed I had planted *Peucedanum palustre*, *Daucus carota*, *Skimmia japonica*, and the common garden fennel.

On May 25th I found my English females had commenced to lay eggs, and had selected in the first instance the *Peucedanum* and the *Skimmia*, but the next day they were laying on fennel. In the compartment for the all Continental the food-plants were *Skimmia*, parsnip, parsley, and fennel, and, although I searched carefully, no eggs were found on anything but fennel, but on that there were a very large number.

I let out into the garden about two hundred and fifty *machaon*. Those in the garden paired freely, and while some remained flying about the open over the rough grasses, the majority evidently dispersed. From reports in the Entomological Press and from private information these *machaon* must have distributed themselves over a wide area in all directions.

It was beautiful to see them dashing backwards and forwards over the open spaces, and at the same time to see *Papilio philenor* slowly circling round in the openings among trees. I noticed the latter kept to the trees, while the *machaon* avoided them.

The *machaon* laid sparingly on fennel in the garden where the fennel was dotted about the rough grass. The larvæ on the fennel in the garden did not succeed in growing up, but disappeared when they were about an inch long. I suspect birds.

With reference to birds and *machaon* larvæ, I experimented by putting about one hundred and fifty three-parts-grown larvæ on *Skimmia*, which is growing in large clumps in the open. In three days the larvæ were all gone, and sparrows were seen flying away from the clumps.

The extraordinary number of small birds in Essex must surely be answerable for much of the present-day scarcity of butterflies. In woods crowded with game-birds one can also see a reason for the absence of many species of butterflies one would expect to find.

Second brood.—The first of the second brood emerged on June 8th and all were out by July 28th and mostly set free in the garden. Some remaining in the house laid large quantities of eggs. There being so many larvæ I allowed them to feed on the growing plants in the house, and not, as hitherto, having them fed in leno cages. When nearly full fed I transferred the greater number to cages, as an easier means of collecting the pupæ. Here it is interesting to note that wasps cut holes in the rather old leno, entered the cages, cut up larvæ, and flew off with suitable-sized pieces. Later I found Diptera emerging from *machaon* pupæ suspended in the cages. I removed some pupæ from the cages and put them in a protected box, after having weeded out all those which appeared stung. In October I found another batch of Diptera in the box.

On December 1st I examined one hundred and seventy pupæ in the box and found them all stung, and with the parasitical grubs in various stages of development. This was the end of that brood.

The parasite which destroyed all my *machaon* is a Cheleid belonging to the genus *Pyromelas*, according to Mr. H. Rowland-Brown, who kindly identified them for me. This seems to show that these flies can lay their eggs in pupæ of any age.

One curious fact is that no *machaon* pupæ of the first brood hybernated in either 1910 or 1911. Those of 1910 were all of foreign origin.

Those of 1911 were partly of foreign origin and partly half-breeds, having English mothers and foreign fathers.

The English *machaon* were distinguishable from the foreign by being of darker appearance.

Young larvæ did not thrive on *Skimmia*, but when large the larvæ fed well on it, and did not show any disposition to wander away in search of other foods.

Cottagers round about here found larvæ of *machaon* on carrot and in some cases promptly killed them, thinking to save their vegetables. In other cases they fed them up successfully.

1912.—This year I have heard of some *machaon* being seen in the district. One only was seen in my garden. I conclude circumstances are too strong for this fine species, and he cannot establish himself.

In conclusion, and in confirmation of my last remark, the larvæ which were allowed to fend for themselves in the house and pupated, were all stung, so that not one remains.

It is well known that Continental *machaon* are found in all manner of situations, whether marshy or on dry hills, and the same race should be able to maintain themselves anywhere in the South of England, were it not for their enemies.

The Tower, Heybridge, Essex: Nov. 14th, 1912.

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## SOME BIOLOGICAL NOTES ON *RAPHIDIA MACULICOLLIS*, STEPH.

BY C. B. WILLIAMS, B.A., F.E.S.

DURING March, April, and early May of this year I took larvæ and pupæ of a *Raphidia* in some numbers under the loose bark of pine-stumps on Oxshott and Wisley Commons in Surrey, pupæ being found as early as March 23rd. Some of the pupæ from Oxshott hatched and proved to be *Raphidia maculicollis*, Steph.; those from Wisley unfortunately died through being kept too dry, but I feel confident that they were the same. I found it necessary to keep the pupæ on moist moss to prevent them from drying up.

On May 4th a female *R. maculicollis* emerged from one of the Oxshott pupæ and was put with a male of the same species which I had captured that day at Oxshott. The two were kept in a glass beaker closed with a piece of cloth and were fed daily on rose aphids (*Siphonophora* sp.) which they took quite readily. The mode of feeding was as follows: the aphid was approached slowly and cautiously at first, then captured by a sudden rush and raised aloft in the jaws, the long prothorax of the snake-fly being elevated in the manner characteristic of these insects. The prey was then slowly but completely consumed, the legs and antennæ, which usually stuck on the head of the *Raphidia*, being cleaned off by drawing the tarsus of the front leg forwards over the top of the head. The pieces were in this way transferred to the tarsus which was then drawn downwards between



the mandibles and the last remnants were removed and eaten up. The adults also readily drank drops of water which I put in. During feeding the female frequently wagged her ovipositor as if in appreciation, and after every meal the antennæ were cleaned with the tarsus of the front leg, in a way similar to that described above for the head.

A piece of rotten wood, deeply cut with a knife, was put in with them, and on this the female was seen probing with her ovipositor, from the end of which drops of black excreta were often expelled.

On May 28th the male died (after nearly four weeks), and on June 17th, the female being still alive, the rotten wood was removed and examined for eggs, of which many were found in the cuts in the wood, together with very small larvæ. The eggs were slightly transparent, very pale yellow in colour, and about 1.2 mm. long by 0.3 mm. broad. In shape elongate cylindrical, slightly more pointed at the tail end than at the head; at the head end with a small white globular appendage.\* A few eggs which were removed to a microscope slide for examination began to hatch immediately, and I was fortunate in being able to observe the whole process. The shell first split behind the globular appendage and the young larva emerged with the head bent downward along the ventral side of the prothorax. In one case four and a half minutes after the first signs of hatching the head was free, and in three minutes more the larva was walking about on the slide.

The young larvæ were about 1.5 mm. in length and pale brownish white in colour. The head was about 0.25 mm. long, with rather stout three-jointed antennæ of slightly over half its length. Unfortunately all these larvæ have died, but others which I have readily drink water, as did the adults, and will eat killed house-flies as well as aphids, in the former case eating only the softer parts.

On July 11th the original female died, after having lived two and a half months. The whole time that the male was with her she made no attempt to attack it, yet on an occasion when I put two females together for a few hours one of them bit the head off the other and ate its abdomen. The larvæ also are cannibalistic, if given the opportunity, usually leaving only the head of their victim.

Some time during April a parasitic grub came out from a

\* Mr. C. T. Lyle, in describing the egg of *Raphidia notata* (Entom. xli. 1908, p. 233), says "the eggs . . . had a very short pedestal at the thicker end. They stood erect on this, and were in contact with one another, as is the case with the eggs of *Sialis*." The eggs which I describe were lying in the cut in the decayed wood and could not be said to stand on any end in particular, but as the "pedestal" is at the head end in these, and in *Sialis* eggs also it is at the apex and not at the base, I think Mr. Lyle must be mistaken in saying that the eggs stood on this end.

lateral hole near the end of the abdomen of one of the Wisley larvæ, which, as I have said, I believe to have been *R. maculicollis*. This grub spun a white elongate cocoon, and on May 7th a female Ophionid emerged, which has been kindly identified by Mr. Claude Morley as *Pyracmon melanurus*, Holmg. Mr. Morley further tells me that this is the first certain confirmation of this species as British, and also is the first definite record of the host of this genus of ichneumons.

The John Innes Horticultural Institution, Merton, Surrey:  
November, 1912.

## FURTHER NOTES ON HESPERIID CLASSIFICATION.

By H. ROWLAND-BROWN, M.A., F.E.S.

IN some previous notes (Entom. xliii. pp. 306-9, and xlv. pp. 5-7) I made an abstract of the work of some French and Swiss lepidopterists engaged in the task of separating the western palæarctic members of the genus *Hesperia*. With their kind permission I now offer a brief summary of the later discoveries of M. Charles Oberthür, Dr. J. L. Reverdin, and M. Marcel Rehfous, whose publications during the past year have thrown much additional light upon the problem of the specific identity of the "Black-and-White" Skippers.

### (i) *HESPERIA ALVEUS*, Hb., and *HESPERIA ARMORICANUS*, Obthr.

First comes the announcement that *Hesperia armoricanus*, Obthr., included in my list as a var. of *alveus*, Hb., on the strength of an examination of the male genital armature, is a distinct species, constituting, I think, an epoch-making addition to our knowledge of the group. To M. Oberthür belongs the credit of distinguishing this smaller Hesperiid, which he describes (Lépid. Comparée, fasc. vi. p. 104) as "neither *alveus*, nor *cirsii*, nor *carlinæ*, nor *onopordi*, though bearing a resemblance to all four species." While Dr. Reverdin, with characteristic thoroughness, has worked out the structural as well as the superficial differences of the two butterflies (Bull. Soc. Lépid. Genève, vol. ii. fasc. 3, pp. 141-148). With regard to the structure of the appendages, he professes himself quite satisfied that both species present differences "more or less marked, but constant," and premises his conclusions with a minute diagnosis, illustrated by photographs of dissections.

He then goes on to point out that in size—admittedly not a distinctive character of great value—*armoricanus* is almost invariably the smaller insect. But, while the shape of the wings in both species, especially the elongate anal margin of the hind wings, seems at first sight identical, an examination of parallel

series reveals the fact that the wings of *armoricanus* are less elongate in this respect, and that the butterfly is more compact ("plus ramassé, si l'on me permet cette expression"); the contour of the wings approaching that of *onopordi*, and differing from that of *alveus*.

Upper side, coloration: *armoricanus* less deeply black, and greyer; white spots more conspicuous, especially on the hind wings; median band, hind wings, much accentuated, and the colour pure white or nearly so (more resembling in this respect *cirsii*); while in *alveus* it is brownish or greyish.

Under side, fore wings: In *alveus* more or less blackish, especially outside the "Q" mark; in *armoricanus* grey, and more evenly distributed.

Hind wings: In *alveus*, ground colour yellow-olive-green, uniform, or nearly so; in *armoricanus*, tint at once more variable and less uniform; ground colour greyish, yellowish, or reddish, with deeper brown markings, especially at the costal margin, and outside the median band of spots. Nervures clearly defined either in yellow or pale grey. In *alveus* the nervures do not stand out at all, or much less definitely. Median band relatively much narrower in *armoricanus*. Outer margin slightly convex in *alveus*, thus giving the basal band of spots a broader and more conspicuous appearance than in *armoricanus*.

The fringes, palpi, and antennæ exhibit no appreciable differences, but the abdomen of *armoricanus* is apparently more elongate than that of *alveus*, reaching beyond the anal angle.

Dr. Reverdin also remarks *en passant* that *armoricanus* and *cirsii* have been confused together owing to the prominence in both cases of the nervures on the under side of the hind wings. But though, as M. Oberthür says, the former resembles in some respect the latter insect, the intradiscoidal spot on the upper side of the fore wings in *alveus* and *armoricanus* is convex towards the outer margin; in *cirsii* it is rectilinear. This peculiarity was discovered by my lamented correspondent, the late M. F. Delahaye, of Angers, and appropriately enough it is designated by M. Marcel Rehfous, "la signe de Delahaye"—"Delahaye's mark."

But for the collector anxious to identify his unnamed Hesperiid of this group in the field, or (if labelled) in the cabinet, there is an easier method of determination than structural or superficial characteristics, as in the cognate cases (with the additional clue of latitude) of *H. malvæ* and *H. malvoides*. For, whereas *armoricanus* is certainly double-brooded in the majority of localities, *alveus* has but one emergence. *Armoricanus* flies in May and June, and the first generation should be exhausted before *alveus* is on the wing from mid-July to the end of August; the second emergence takes place in late August and September, though in normal seasons possibly the laggards of *alveus* overlap the first of the new *armoricanus*.



This phenological evidence M. Rehfous supplements with the significant observation that the food-plants of the two species are different. *Alveus* affects *Helianthemum vulgare*; *armoricanus*, *Potentilla reptans*, and probably also *Fragaria vesca*, as a female was seen to lay an egg on a leaf of this plant (Bull. Soc. Lépid. Genève, 1912, vol. ii. fasc. 3, pp. 149-152). A comparison of the ova and the young larvæ in the early stages reveals also certain characteristic distinctions. But the complete life-history of *Hesperia armoricanus* has yet to be told. Elsewhere I have expressed the opinion that British examples of *H. alveus* recorded by Barrett and other writers will turn out to be *H. armoricanus*, for this reason among others, that where *armoricanus* occurs in Brittany and on the other coasts contiguous to Britain, *alveus* is absent. The published figures of "British" *alveus*, both by their size and markings, further suggest that the species over here has been wrongly—or perhaps, in view of the very recent nature of M. Oberthür's discovery, I should say incorrectly—identified.

(ii) *HESPERIA FRITILLUM*, Hb., and *HESPERIA CIRSII*, Rbr.

Assuming that it is agreed to sink *fritillum*, Rambur, in *malvoides*, Ed. & Elwes, as advised, and accepted by Dr. Reverdin (Bull. Soc. Lépid. Genève, vol. ii. fasc. 2, 1911, cited by me Entom. xlv. p. 5), the doubt still existed as to the specific identity of the female Hesperiids figured by Hübner in his 'Europaischen Schmett.' pl. 92, and numbered 464, 465 (and coincidentally of the males figured by Herrich-Schäffer, Nos. 33 and 34 in his 'Syst. Bearbeitung der Schmet. von Europa,' bande i. Regensburg, 1843).

M. Oberthür (*loc. cit.*) now suggests that Herrich-Schäffer considered *fritillum*, Hb., to be the same butterfly as *cirsii*, Rambur, and a comparison of the "*cirsii*" in his collection (which includes some of the actual Rambur co-types of the species) with Hübner's figures confirms him in the belief that this is the correct view; Dr. Reverdin and Dr. Charles Blachier concurring.

Thus the name *cirsii*, Rbr., falls as a synonym of *fritillum*, Hb., but M. Oberthür, recognizing a constant form of the butterfly in localities near Paris, and on into Touraine, proposes the retention of *cirsii* for this variety, and reconstitutes the nomenclature of the species as follows, with *fritillum*, Hb. (= *cirsii*, Rbr.), for the type form.

Meanwhile, Dr. Reverdin tells me that he has somewhat modified his views upon the specific identity of *cirsii*, Rbr., as a var. of *carlinæ* (*cp.* my "Note on the New Classification of certain Hesperiid Butterflies," Entom. vol. xliii. p. 308). There are certain later discovered differences in the structure of the appendages, and apparently the two insects have different

periods of emergence. I take it, therefore, that the classification of these western palæarctic Hesperids should now be as follows:—

H. CARLINÆ, Rbr.

H. FRITILLUM, Hb. (= CIRSI, Rbr.)

(a) ab. *herrichii*, Obthr.

(b) var. *iberica*, Gr. Gr.

(c) var. *siciliæ*, Obthr.

preceded by H. ALVEUS, Hb.

(a) var. *foulquieri*, Obthr.

(b) var. *ryffელensis*, Obthr.

(c) var. *numida*, Obthr.

(d) var. ? *ballotæ*, Bsdv.

H. ARMORICANUS, Obthr. (= FRITILLUM, Bsdv., and JACÆ, Guén. (*in litt.*)).

H. BELLIERI, Obthr.

For it seems that *bellieri*, the butterfly described as a variety of *alveus*, and certainly very distinct superficially from it, will also turn out to be a separate species.

(To be continued.)

## THE LEPIDOPTERA OF THE NORWEGIAN PROVINCES OF ODALEN AND FINMARK.

By W. G. SHELDON, F.E.S.

(Concluded from vol. xlv. p. 340.)

*Brenthis polaris*.—Schöyen seems to have found this species in abundance in various localities in the Porsanger Fjord in 1878 and 1879, but Herr Bye, who many years since collected a few Lepidoptera, informed me that for years it had been very scarce, and was not at all sanguine as to its present occurrence. I was therefore, perhaps, fortunate to obtain sixteen fine examples near to Kolvik. These were obtained in one small locality of perhaps fifty yards by twenty, although I searched closely miles of similar ground on both sides of the Fjord.

The localities frequented by *B. polaris* in this district are rough dolomite screes, on which the only plants growing are *Dryas octopetala* and occasional tufts of a very dry grass. Schöyen suggests that the larva feeds upon the former plant, and there does not seem to be any other reasonable hypothesis. The imago flies swiftly, irregularly in the case of the male, but steadily in that of the female; only in the brightest sunshine, and after the sun has been shining for some time. At intervals they will settle on the bare scree, always with wings outstretched, but never on anything else, so far as my observations went. I saw one female, which I could not very well follow rapidly, fly over a low belt of birch-scrub growing on the edge of the locality in which the species occurred, and settle on the scree



beyond, within two or three feet of the farther edge of the scrub. The small locality in which I found my specimens is figured on Plate xii.; they flew over the slopes which are in the front of the plate, at a height of from 50 ft. to 300 ft. above the level of the Fjord. The dark patches here are composed entirely of *Dryas octopetala*.

I do not know a good figure of this species, and have therefore given a photograph of it on Plate xiv., figs. 5 and 6, together with its nearest arctic ally *B. freija*, figs. 1, 2, and 3, to which it has a close superficial resemblance; the two can, however, be at once distinguished by the T marks in the outer margins of the inferiors in *B. polaris*.

*B. frigga*.—This species was common but worn at Laxelv from July 11th onwards. So much so, in fact, that I could have netted two dozen or more examples on July 12th had I been so disposed, but unfortunately the majority were too battered for cabinet specimens, and I had to content myself with about a dozen altogether. The Porsanger examples have the pale central fascia on the under side of the inferiors much more suffused with reddish brown than my Central Sweden specimens; this form is noted by the original describer of the species, Thunberg, whose type-specimens came from Lapland.

*Encis norna*.—I found this species just emerging at Bossekop during the last day or two of my stay, and saw three or four specimens. At Kolvik it was common on the rocky lower slopes of the dolomite, and a few worn examples were seen at Laxelv.

Authors, including Kane and Lang, have described the type of this species as having two ocelli on each of the front and one on each of the hind wings. The original description and figure by Thunberg in 'Insecta Suecica,' however, gives three ocelli on each of the front and one on each of the hind wings, and of course this form must thus be taken as the type in nomenclature.

My Porsanger series of fifteen males and twenty-one females includes seven females, but not any males, of this form. Of the three-ocelli form which Kane and Lang have treated as the type, I have six males and three females; for this form I propose the name of *tripupillata* n. ab. Of the forms I obtained last year at Abisko (see 'Entomologist,' vol. xlv. p. 68), the series includes four males and four females of ab. *bipupillata*, Sheldon; one male of ab. *unipupillata*, Sheldon; three males of ab. *obsoleta*, Sheldon; and two females of ab. *pallida* Sheldon; in addition to these I have two ab. *ochracea*, Aurivillius; and one male and three females which have an excess of ocelli over what obtains in Thunberg's type. I believe in certain Scandinavian localities forms with a variable number of ocelli in excess of those of the type are not uncommon, and the most convenient way of dealing with these seems to be to call them all ab. *excessa*, n. ab.

*Erebia medusa*, var. *polaris*.—One would naturally expect to find this to be one of the most widely distributed of Arctic Diurni, but except at Laxelv I did not see it; there it was common and in good condition at the time of my visit.

*E. disa*.—This fine species was one of the special objects of my search. At Bossekop Staudinger apparently found it not infrequent, and one forms the opinion on reading his account of the Lepidoptera

of that place, that it chiefly occurred in the large low-lying and very wet swamp behind the church; and acting on this clue I passed the best part of four days therein, pretty well up to my knees in water most of the time, with the result that in that period I obtained one specimen, which was accidentally kicked up on June 14th on a wet moor between the Ebydal Road and the Alten River. On June 19th it occurred to me that either Staudinger's swamp had changed since his visit, or that his account was wrong; and taking a wide sweep I investigated the moors between the Ebydal Road and the Skadavaara Mountain. Here, on this day, I found *E. disa* locally quite common, taking nineteen specimens in perfect condition, and on the following day twenty-six more. It frequented a rather wet track overgrown with *Vaccinium*, with a certain amount of a fine grass much resembling *Aira cespitosa*.

It was fortunate that I stumbled across the species at Bossekop, for although Schöyen appears to have found it common everywhere in the Porsanger Fjord, with the exception of two or three examples seen three or four miles up the valley of the Laxelv, I did not see the species in this district.

My series taken at Bossekop consists of thirty-seven males and nine females. Of these thirty males and six females agree with Thunberg's description of the type in having on each superior four blind ocelli. Four males and three females have an additional ocellus on each superior; for this form I propose the name of *ab. addenda*, n. ab. (Plate xiii., fig. 3); whilst three males have the ocelli very much obscured and reduced in size, *ab. obscura*, n. ab. (Plate xiii., fig. 2.)

*E. lappona*.—This is probably the most abundant and widely distributed butterfly to be found in Arctic Norway, occurring commonly in every locality I visited. The form is a very bright one, with much brown on the upper surface. In certain examples of my series the brown, of which there is in typical specimens a patch near the apex of the front wings, extends to the bases. This very striking form I have in both sexes from Porsanger and Alten, and propose for it the name of *brunnea*, n. ab. Another form of variation is that two of my Porsanger females have splashes of the brown which is found on the under side of the superiors, on the under side of the left inferior. *E. lappona* was even to be found round Hammerfest. I spent two cloudless days—June 24th and 25th—wandering over the desolate mountains there, during which the only Lepidoptera seen were a few examples of this species.

*Hesperia andromedæ*.—I saw a few examples of this species at Kolvik, and captured five. They frequented the same description of ground as *Brenthis polaris*, but higher up; in fact, on the top of the dolomite hills, which rose out of the fjord 500 or 600 ft.

Amongst the Heterocera observed were:—

*Anthrocera exulans*.—Two specimens taken at Kistrand on July 23rd. These are somewhat worn, and thus one cannot well say what form they represent, but they are rather small examples, with pale red markings.

*Pachnobia hyperborea*.—A grey Noctua, captured flying freely in

the sun shortly before noon on July 23rd at Kistrand, turned out to be this species. Anyone acquainted only with Scotch specimens would not recognize this one as *P. hyperborea*, but it agrees well with examples from Lapland in the National Collection.

*Plusia hohenwarthi*.—Common at Laxelv. I did not see it elsewhere.

*Anarta melaleuca*.—This beautiful little species was abundant everywhere on moors in the Porsanger district, resting on rocks, and flying wildly off as one approached.

*A. zetterstedtii*.—Abundant on the dolomite screes at Kolvik, flying briskly in the sun, and settling on the bare rock. In dull weather not a specimen could be seen, or even kicked up. The food-plant is no doubt *Dryas octopetala*, which is the only plant except grass growing in its haunts.

*A. richardsoni*.—Not uncommon in the same locality as the last species, and, like it, flying freely in the sun.

*Gnophos sordaria*.—A light grey form of this was abundant at Kolvik; the white dolomite rocks were answerable for the colour.

*Psodos coracina*.—Abundant everywhere in the Porsanger Fjord. The specimens varied from black to almost white, the colour depending upon the nature of the strata the examples frequented.

*Larentia cæsiata*.—Common everywhere.

*Melanippe hastata*, var. *hastulata*.—Not uncommon at Bossekop.

*M. montanata*.—Common at Laxelv.

*M. fluctuata*.—Generally abundant.

*Coremia munitata*.—Perhaps the most abundant Geometer I saw north of the Arctic Circle, occurring everywhere abundantly; a small form.

*Cidaria polata*.—A few examples in most localities.

*C. frigidaria*.—Common at Kolvik.

In the course of my two expeditions to Scandinavia I came across, in more or less abundance, all the Diurni occurring there which are not found in Central Europe, with the exception of two, *Melitæa iduna* and *Brenthis chariclea*. As these species are both very local and imperfectly known to lepidopterists, it may not be out of place to say a few words about them.

*Melitæa iduna* is apparently to be got with certainty at Krickjock, in Swedish Lapland, and has been reported from Abisko, but this latter report requires confirmation. In Arctic Norway it has been taken by various entomologists in the Sydvaranger Fjord, and W. M. Schöyen took one example (a female) at Laxelv, in the Porsanger Fjord, on July 18th, 1879. It is described in Seitz as being found in Lapland and Central and North-east Siberia, where it flies in early July in abundance in barren alpine meadows, at altitudes of from 6–8000 ft., in company with *M. cinxia* and *Brenthis aurinia*.

*Brenthis chariclea* is one of the rarest, if not the rarest, of European Diurni. The only records I can find are that Staudinger took twelve examples at Alten, July 17th to 26th, 1860, where it was afterwards found by Sandberg. In 1878

one example was taken by Hornemann at Hammerfest, and W. M. Schöyen found one at Karasjok, July 30th, 1879, and some more at Kistrand during the first week in August the same year; these latter, four in number, and the Karasjok specimen, I saw in the National Collection at Christiania in June last.

Herr Sparre Schneider writes that it is the only butterfly occurring in Arctic Norway that he has not taken.

Herr Bye informed me that between twenty and thirty years ago he, with another inhabitant of the Porsanger Fjord, took specimens not infrequently at Kistrand and Laxelv, which were sent to Germany. I have also seen it stated somewhere that specimens have been found in the Kola Peninsula, Russian Lapland.

I recently wrote to Staudinger for an example of the European form, which is distinct from those occurring elsewhere, but was informed by him that it could not be supplied, and that specimens coming into the market in old collections were invariably the American form.

Seitz says that the butterfly flies only at noon, with preference at the foot of rocks which are well warmed by the sun, becoming at once lethargic when struck by the cold wind. The form of this species, known as var. *boisduvalii*, is widely distributed in Arctic America, and var. *arctica* from Greenland and Nova Zembla perhaps extends the farthest north of all butterflies.

Youlgreave, South Croydon: October 12th, 1912.

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## NOTES AND OBSERVATIONS.

THE NEW DEPARTMENT OF ENTOMOLOGY AT THE NATURAL HISTORY MUSEUM.—The Principal Trustees of the British Museum have appointed Mr. Charles Joseph Gahan, M.A., First Class Assistant in the Department of Zoology, to the newly created post of Keeper of the Department of Entomology. Hitherto, for administrative purposes, there has been an Entomological Section of the Department of Zoology; in future there will be a special Department of Entomology under its own Keeper. Mr. Gahan will take up his new duties at the beginning of the next financial year.—‘The Times,’ December 12th, 1912.

THE NOCTUID GENUS *ALYSIA*.—The New Zealand genus *Alysia* has been revived by Warren, apparently with good reason, but unfortunately *Alysia*, Guen., 1868, is a homonym of *Alysia*, Latr., 1804, a well-known genus of Hymenoptera. The lepidopterous genus may be known as *ALYSINA*, n. n.; type *Alysina nullifera* (*Agrotis nullifera*, Walker, *Alysia specifica*, Guen.). *Setagrotis* and *Maoria*, Warren (Seitz, ‘Macrolepidoptera, Fauna Indoaustralica’), are also pre-occupied names, and must be changed. For a discussion of the genera related to *Alysina*, see J. B. Smith, Jn. N. Y. Ent. Soc. 1907, p. 156.—T. D. A. COCKERELL; Boulder, Colorado.



THE HODGES AND HARRISON COLLECTIONS.—On the 12th and 13th November last the collections of British Lepidoptera formed by Mr. Albert J. Hodges and the late Mr. Albert Harrison were disposed of at Stevens's Auction Rooms. Both were modern collections, and the specimens contained in them were practically all labelled with more or less full data. In the Hodges collection, which was sold first, there were several good varieties, and these attracted some little attention: thus, an exceptionally dark *Argynnis aglaia* brought eleven guineas. A lot in which was included two pinkish forms of *Anthrocera filipendule* and a yellow variety of *Euchelia jacobææ* realized 47.6; and another containing two yellow *A. filipendule* and a confluent yellow *A. trifolii* made three guineas; while an *IVI* variety of *Senta irrorella* with an asymmetrical specimen and sundry other species sold for a guinea. The two specimens of *Abraxas grossulariata* that were figured in the 'Record,' vol. iv. plate c, figs. 13 and 14, and which were catalogued as "magnificent varieties," caused some spirited bidding, the one being knocked down at £6 10s., and the other at £7. Among the rarer species two lots, each containing two specimens of *Sphinx pinastri* with six *S. convolvuli* and three or four *Acherontia atropos*, sold for 27/- each lot; nine *Leucania albipuncta* with three *L. vitellina* and other species for 30/-; five *Hydrilla palustris* for 65/-; and two lots, each containing two fine specimens of *H. palustris* with other species, for 42/- and 35/- each lot. *Drepana sicula (cultraria)* sold in lots of two or three made from 10.6 to 5/- a specimen, according to condition; and *Crymodes exulis* from 13/- to 8/- apiece; while for *Acidalia humiliata*, one of Mr. Hodges's specialities, sold in lots with about seventy other *Acidalias*, brought for a lot containing a dozen 13/-, and for one containing eight 11/-.

The Harrison collection was remarkable for the perfection of the specimens of which the long series were composed, and the exact data with which they were accompanied, rather than for the rarity of the species or any striking varieties, but many of the lots appeared to attract a good deal of attention. Thus a lot containing twenty-seven *Pieris brassicæ*, some of the males of which had small discal spots, and a couple of the females with the spots somewhat confluent, together with thirty-five *P. rapæ* brought 28/-, and a similar lot 20/-; lots of about one hundred *P. rapæ* each realized, for one containing a female with discal spots united, 35/-, and others 20/- and 16/- a lot. A series of forty-two *Argynnis aglaia* from North Cornwall sold for 24/-, lots of about seventy *Melitæa aurinia* from Kent, North Wales, Ireland, &c., for 19/- to 20/-, and lots of about sixty *Eugonia polychloros* and *Aglaia urticæ* for 12/- to 18/- a lot. A specimen of *Plebeius ægon*, possibly hermaphrodite, included in a lot of about sixty others, went for a guinea, and the fine series of *Lycena arion*, about thirty each, from North Cornwall, for from 20/- to 23/- the series. A couple of "golden" males of *Cosmotriche potatoria* took the lot in which they were included up to a guinea, and another somewhat similar lot made 15/-. The interesting series of *Aplecta nebulosa*, chiefly bred from Delamere Forest, North Cornwall, Epping Forest, and Argyleshire, and including some fine



examples of var. *thompsoni*, were put up in six lots, and brought for the best 47/6, and for the other five from 35/- to 30/- per lot. The long series of *Pieris napi*, on which the late Mr. Harrison in conjunction with Mr. H. Main had expended so much time and attention in their experiments in crossing various local forms, were not included in the sale.—R. A.

DRAGONFLIES BRED IN 1912.—I have bred this year *Cordulegaster annulatus* (one), *Æschna cyanea*, *Libellula quadrimaculata*, *Ischnura elegans*, *Agrion puella*, *Pyrrosoma nymphula*, *Erythromma najas*. I was able to watch the emergence of an *Æschna cyanea*, which took place about midnight. I noticed a nymph running up and down a stick in apparently great agitation. This was the prelude to emergence. The process, up to the expansion of the wings, took just an hour. The nymph of *C. annulatus* I had had in an aquarium over two years. It was, of course, in but an early stage of growth when I took it from Oberwater stream, in the New Forest, last June two years; but it was not so immature as to suggest that it would remain for more than two years in the nymph stage. The imago finally emerged towards the end of June in this year. I did not take its measurements when I first got it, but, roughly, I should say from memory, it was about a quarter grown. How long had it probably been in the nymph stage already? In all I suppose that stage must have lasted for some two years and a half, seeing that I had it more than twenty-four months. The nymph of this species seems to spend practically its whole life in the mud at the bottom (or in the banks), coming to the surface only occasionally—to change its skin, for instance. But though hidden from view, I have found these nymphs frequently only just below the surface; being near enough to the top to take a worm before it had begun to burrow. They are more deadly accurate in their “shooting” than any others; yet they appear generally to be very sluggish creatures, more so than other nymphs, such as *L. quadrimaculata*, which also live mainly in the mud; and in marked contrast to the liveliness of the *Æschna* nymphs, which go down into the mud only in quite cold weather. This, at least, has been my observation; I speak, of course, of those I have kept. I am puzzled at the extreme uncertainty of finding nymphs. You may “fish” in streams and ponds where dragonflies swarm every summer and hardly find a nymph; they will also be plentiful one season and very scarce the next in the same place. There are places, no doubt, where you can practically make certain of some species, such as *Æschna cyanea*, *Libellula quadrimaculata*, or, amongst the Zygopterids, *Agrion puella*. But even these constant inhabitants vary much in numbers from year to year. Others less common disappear entirely some years. I used to make certain of finding *Cordulia aenea* in the canal near Byfleet. For two or three seasons I have not seen one there; but I am not there more than two or three times in a year. I may have struck bad days. But nothing in this way surprised (and disappointed) me so much as a nymphing expedition to Wicken Fen in the first week of last May, which produced nothing but one or two of the commonest Zygopterids. I wanted especially to get the nymphs of *Brachytron*

*pratense*, of which the imago is common in the fen. Maybe I did not go the right way to work. I have not time to take entomology as seriously as I should wish, but I should like to know where I went wrong.—HAROLD HODGE; 9, Highbury Place.

LEPIDOPTERA ATTRACTED TO LIGHT.—The following is a list of Lepidoptera taken at light last year in a room lit by two acetylene lights. The dates are the earliest on which each species was observed:—*Smerinthus populi* (two), May 13th and 22nd; *Euchelia jacobææ*, May 13th; *Spilosoma mendica*, May 14th; *S. lubricipeda*, June 5th; *S. menthastris*, May 4th; *Hepialus lupulinus*, Aug. 20th; *Porthesia auriflua*, Aug. 7th; *Dasychira pudibunda*, May 4th; *Pæcilocampa populi*, Nov. 18th; *Drepana lacertinaria*, May 15th and Aug. 7th; *D. falcataria*, Aug. 14th; *D. binaria*, May 4th; *Cilix spinula*, May 4th and Aug. 7th; *Dicranura bifida*, June 17th; *Pterostoma palpina*, May 4th and Aug. 14th; *Lophopteryx camelina*, May 4th and Aug. 7th; *Notodonta dictæoides*, Aug. 8th; *Clostera reclusa*, April 20th; *Diloba cæruleocephala*, Oct. 20th; *Acronycta psi*, May 4th; *Leucania lithargyria*, June 30th; *L. comma*, June 7th; *L. impura*, June 30th; *L. pallens*, June 30th; *Tapinostola fulva*, Sept. 16th; *Hydræcia nictitans*, Aug. 10th; *H. micacea*, Sept. 4th; *Axyليا putris*, June 8th; *Xylophasias rurea*, May 30th; *X. lithoxylea*, June 8th; *X. monoglypha*, June 17th; *Neuronia popularis*, Aug. 27th; *Cerigo cytherea*, Aug. 10th; *Luperina cespitis*, Sept. 5th; *Mamestra sordida*, June 14th; *Apamea didyma*, Aug. 6th; *Miana strigilis*, June 7th; *M. fasciuncula*, May 30th; *Grammesia trigrammica*, May 22nd; *Caradrina morpheus*, June 7th; *C. blanda*, June 10th; *Rusina tenebrosa*, June 7th; *Agrotis puta*, Aug. 7th; *A. segetum*, July 6th; *A. exclamationis*, June 3rd; *A. corticea*, June 29th; *Noctua plecta*, June 17th; *N. festiva*, July 3rd; *N. rubi*, June 26th; *N. umbrosa*, Aug. 16th; *N. xanthographa*, Aug. 16th; *Triphæna ianthina*, Aug. 16th; *T. comes*, Aug. 30th; *T. pronuba*, June 30th; *Amphipyra tragopogonis*, July 29th; *Tenio-campa gothica*, April 10th; *Orthosia lota*, Sept. 28th; *Anchocelis pistacina*, Sept. 27th; *A. lunosa*, Sept. 4th; *Cerastis vacinii*, Oct. 21st; *C. spulicea*, Sept. 23rd; *Scopelosoma satellitia*, Nov. 1st; *Xanthia citrigo*, Sept. 4th; *X. flavago*, Sept. 16th; *X. ferruginea*, Oct. 6th; *Calymnia diffinis*, July 10th; *Dianthæcia capsicola*, May 30th; *Miselia oxyacanthæ*, Oct. 21st; *Hadena dentina*, May 20th; *Xylocampa lithoriza*, May 4th; *Cucullia umbratica*, June 17th; *Plusia chrysitis*, June 30th; *P. moneta*, June 19th; *P. gamma*, May 23rd; *Catocala nupta*, Sept. 14th; *Ourapteryx sambucaria*, June 30th; *Epione apiciaria*, Aug. 14th; *Rumia luteolata*, May 6th; *Angerona prunaria*, July 7th; *Metrocampa margaritaria*, June 17th; *Eurymene dolobraria*, June 7th; *Pericallia syringaria*, July 5th; *Selenia bilunaria*, May 5th; *S. lunaria*, May 30th; *Odontopera bidentata*, May 3rd; *Crocallis elinguaris*, Aug. 14th; *Ennomos alniaria*, Aug. 15th; *E. erosaria*, Sept. 14th; *Himera pennaria*, Sept. 21st; *Hemerophila abruptaria*, May 3rd; *Boarmia repandata*, June 17th; *B. gemmaria*, June 30th; *B. roboraria*, June 30th; *Tephrosia biundularia*, May 15th; *Geometra papilionaria*, July 10th; *Iodis lactearia*, June 17th; *Ephyra porata*, May 4th; *Acidalia scutulata*, July 2nd; *A. subsericeata*,

June 17th; *A. imitaria*, June 16th; *A. aversata*, June 17th; *Timandra amatoria*, July 1st; *Cabera pusaria*, June 30th; *C. exanthemata*, May 30th; *Strenia clathrata*, July 10th; *Panagra petrarua*, May 30th; *Lomaspilis marginata*, June 17th; *Hybernia aurantiaria*, Nov. 10th; *H. defoliaria*, Nov. 8th; *Cheimatobia brumata*, Nov. 16th; *C. boreata*, Nov. 15th; *Eupithecia centaureata*, May 30th and Sept. 7th; *E. subfulvata*, July 11th; *E. castigata*, May 30th; *Lobophora serralisata*, May 30th; *Melanthia ocellata*, Aug. 12th; *Melanippe fluctuata*, April 17th; *Anticlea derivata*, April 10th; *Coremia designata*, May 30th; *C. unidentaria*, May 6th; *Camptogramma bilineata*, Aug. 30th; *Phibalapteryx tersata*, June 7th; *Cidaria miata*, Oct. 4th; *C. russata*, Sept. 8th; *C. dotata*, June 17th; *Anaitis plagiata*, May 22nd.—H. C. JEDDERE FISHER; Apsleytown, East Grinstead.

HYBERNIA AURANTIARIA IN ISLE OF SKYE.—I took two fine specimens of *H. aurantiaria* at a lighted window here last month, and also a third, which I take to be a variety with ill-defined lines and considerable dark purplish speckling or clouding forming a band behind the second line.—(REV.) ARTHUR S. HOOLE; Kyle House, Kyleakin, Isle of Skye, December 3rd, 1912.

CUCULLIA CHAMOMILLE EMERGING IN NOVEMBER.—I took some larvæ of *C. chamomille* in June, 1912, which pupated in July, and a perfect specimen emerged on Nov. 9th. The larvæ and the box containing the pupæ, although being kept in an outside frame under glass, have not had any artificial forcing, and as the box containing the pupæ was specially prepared with soil, &c., last season, there is no possible room for any doubt about the record. I cannot hear of any similar record previously, and perhaps it may prove of some interest to the readers of your Journal.—W. A. TYERMAN; Derby Villa, Ainsdale, Southport, November 19th, 1912.

NEMEOBIUS LUCINA EMERGING IN DECEMBER.—When looking in my pupa-cage yesterday (December 1st) I was very surprised to find that a fine dark specimen of *Nemeobius lucina* had emerged. Between forty and fifty pupæ have been kept practically out of doors; and there were two or three very cold frosty nights. This is surely a very unusual occurrence, but why only one out of so many?—R. G. BENTON; Cotswold, 52, Queen's Avenue, Muswell Hill, N.

ENNOMOS AUTUMNARIA AT LITTLEHAMPTON.—On August 25th I picked up on the pavement in Littlehampton a larva, which pupated a day or two later, and from which, on September 22nd, emerged a beautiful female *Ennomos autumnaria*.—W. GIFFORD NASH; Clavering House, Bedford.

TORTRIX PRONUBANA AT EALING.—On December 23rd last, Mr. H. Campion was good enough to give me a Tortrix his sister, Mrs. G. J. Ashby, had found resting on the outside of a window-pane, at 58, Ranelagh Road, Ealing, the previous Saturday. The specimen proved to be a fine female of *Tortrix pronubana*. It was alive in the morning of December 24th, but died sometime later that day.—RICHARD SOUTH.



THE ENTOMOLOGICAL CLUB.—A meeting was held on December 12th, 1912, at the Savage Club, Adelphi Terrace. Mr. H. Rowland-Brown in the chair. Other members present were Mr. R. Adkin, Mr. H. Donisthorpe, and Mr. Sich; and the other guests—Professor Selwyn Image, Dr. Karl Jordan, The Rev. George Wheeler, Hon. N. C. Rothschild, Mr. Bonshell, Mr. F. Gilliat, Mr. A. J. Jones (Hon. Member), and Mr. W. G. Sheldon. Mr. Sich proposed and Mr. Donisthorpe seconded that Professor Selwyn Image be nominated an Honorary Member of the Club. This was carried *nem. con.*

WE are informed that the "Verrall Supper," so successful last year, will again be held at the Holborn Restaurant during the present month.

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## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 16th, 1912.*—The Rev. F. D. Morice, M.A., President, in the chair.—The President stated that in pursuance of a suggestion approved by the Council, he had written to most of the surviving ex-Presidents of the Society for their portraits, and had already received several. Thanks were voted to the donors.—The following were elected Fellows of the Society:—Mrs. Ellen M. Waterfield, The Hospital, Port Sudan; Messrs. Patrick Alfred Buxton, M.B.O.U., Fairhill, Tonbridge, and Trinity College, Cambridge; Alfred Noakes, The Hill, Witley, Surrey; Norman Denbigh Riley, 94, Drakefield Road, Upper Tooting, S.W., and British Museum (Natural History), S. Kensington, S.W.; and Henry S. Wallace, 17, Kingsley Place, Heaton-on-Tyne.—Mr. E. B. Ashby exhibited a case of *Rhopalocera* from the French, Swiss, and Italian Alps and from Britain.—Mr. B. Williams, a specimen of an unascertained species of the *Protura*. This order of primitive insects is chiefly remarkable for the absence of antennæ; they use their front pair of legs not as locomotive but as tactile organs, holding them out in front of the head when walking, as if to take the place of the missing antennæ. Various other instances of similar adaptation were mentioned.—Mr. W. J. Lucas, a specimen of *Somatochlora alpestris* from Porsanger Fjord; also a specimen of *Eschna carulea* (= *borealis*), from the same locality. They were captured by Mr. W. G. Sheldon.—Professor Poulton brought forward a note on behalf of the Rev. K. St. Aubyn Rogers, tending to show that occasional migration, due to excessive drought, is sometimes a cause of the spread of butterflies into new localities. He also brought forward a suggestion received from Mr. C. F. M. Swynnerton as to one of the causes which may have operated in the special development of mimicry in forest areas; it is that flying insects are often exceedingly difficult to recognize in forest as against veld. It is by no means easy to at once decide on the coloration of an insect seen flying in a blaze of light against a deep shadow or *vice versa*: also they so frequently disappear behind foliage after having been in view for a few seconds only. Under those circumstances a mere trick of

flight, or the smallest splash of colour in common, had often caused him to take the insect for something that is otherwise utterly unlike it, and such a hesitation would usually cost a bird the insect. He also exhibited, on behalf of Dr. R. C. L. Perkins a male of *Prosopis nubilosa*, Ckll. (Prosopidæ), and of a species of *Halictus* (Andrenidæ) captured by him in the Cairns district of North Queensland (July, 1904). Dr. Perkins had pointed out to the speaker the extremely interesting manner in which the resemblance between these species had been brought about, the hard glistening yellow mark on the black scutellum and post-scutellum of the *Prosopis* and that on its lateral prothoracic tubercles being mimicked by a yellow pubescence occupying the same positions in the *Halictus*. This had been previously noticed by Meyrick, probably in the female of the same species.—The Rev. G. Wheeler, two specimens of a new *Argynnis*, discovered in June last by Mr. Harold Powell, F.E.S., at Lambessa in Algeria. Mons. Oberthür named it *aurantiana*.—Dr. W. A. Lamborn, some cocoons formed by wild larvæ of *Norasura kolga* under natural conditions, under leaves. They gave a good idea as to the mimicry of Braconid cocoons by the formation of little bosses of yellow silk.—Mr. Donisthorpe: (1) A small incipient colony of *Camponotus ligniperdus* taken at Yverne, Switzerland. (2) Specimens of a Proctotrupid new to science, *Loxotropa donisthorpei*, Kieffer, taken in a nest of *Lasius flavus* at Blackgang Chine, Isle of Wight, September 9th, 1912. (3) A specimen of *Camponotus abdominalis* var. *atriceps*, Smdt., an American species which probably had come from the hotel at Weybridge, as he was told of the capture of other specimens there on his next visit.—Mr. L. W. Newman: (1) A long and varied series of the hybrid *Smerinthus ocellatus* ♂ × *Amorpha populi* ♀, bred September, 1912, out of doors, from pairing obtained June, 1912, the larvæ pupating in June and early August. (2) Living specimens of the hybrid *Zonosoma pendularia* ♂ × *omicronaria* ♀ (*annulata*). The specimens showed characters of both species well, and vary somewhat in the quantity of pink coloration. (3) A living male specimen of *Metrocampa margaritaria*, taken at rest in Bexley Woods, October 14th, 1912, which points to a second emergence of this species. (4) A male specimen of *S. ocellatus* bred out of doors on September 14th, from larvæ which pupated in June, 1912.—Mr. K. G. Blair, larvæ of two allied species of Malacoderm from Borneo, brought by Mr. J. C. Moulton. The species to which these larvæ belong are not yet known, although probably belonging to the family Lycidæ.—Mr. H. M. Edlsten, specimens of *Nonagria dissoluta* and var. *arundineta* from East Kent, bred during August, 1912, 75 per cent. from this locality being *dissoluta*.—The following papers were read:—"Notes sur quelques espèces des *Lucanides* dans les Collections du British Museum et de l'Université de Oxford," par M. Henri Boileau, F.E.S. "Synaposematic Resemblance between Acraeina Larvæ," by G. D. H. Carpenter, B.A., M.B., F.E.S.—GEORGE WHEELER, M.A., *Hon. Secretary*.



## RECENT LITERATURE.

*Annals of Tropical Medicine and Parasitology.* Series T. M., vol. vi.  
No. 3, B. Liverpool, October, 1912.

This periodical is well up to its usual form. There is a note on crude carbolic acid as a larvicide. The chief insects referred to in the various papers are *Glossina palpalis* and *G. morsitans*; certain fleas; and some lice, human and other. Members of the medical profession should find this part specially interesting.

W. J. L.

*The Large Larch Sawfly (Nematus erichsonii).* By C. GORDON HEWITT, D.Sc. (Entomological Bulletin No. 5, Department of Agriculture, Division of Entomology.) Ottawa, 1912.

THIS is an exhaustive account (pp. 42), fully illustrated, of an insect-pest, British and Canadian, and will be found as useful to those who have to do with the larch in England as it will be to those who are concerned with it in Canada. It is, in fact, treated to a great extent as a British insect.

W. J. L.

*Memoirs of the Department of Agriculture in India.* Vol. iv.  
Nos. 1 and 2 (May and August, 1912).

IN No. 1 there is an exhaustive article on "Eri Silk," by H. Maxwell Lefroy, M.A., and C. C. Ghosh, B.A.

Eri silk, the product of the larva of *Attacus ricini*, Boisdu., cannot be reeled off from the cocoon in one thread, as in mulberry silk. In the eri cocoon the silk is spun in layers, and so arranged that the emerging moth can push its way through one end of the cocoon without doing any damage to the fibres; there is therefore no necessity to kill the imago.

No 2 contains a paper by Dr. J. L. Hancock on Tetriginæ (Acridiinae) in the Agricultural Research Institute, Pusa, Bihar, with descriptions of new species.

## OBITUARY.

THOMAS BOYD, F.E.S.

ON February 5th last there passed away at his residence, Woodvale Lodge, South Norwood, the oldest Fellow of the Entomological Society save one—Lord Avebury. Thomas Boyd was born on August 8th, 1829 (the second son of William Clarke Boyd), in Ely Place, Holborn; his parents died when he was quite young, and eventually he went to live with an aunt at 17, Clapton Square, N.E., then on the edge of the country. There he developed a taste for natural history, and especially for entomology. As a young man he became an active lepidopterist, and he was elected a life member of the Entomological Society in 1852. During the next few years he

made many contributions to the entomological journals of the period, viz., the 'Entomologist's Companion,' the 'Weekly Intelligencer,' and the 'Entomologist's Annual.' He was the intimate friend of Stainton, and was thus led to pay special attention to the Micros; for the patient study of these his quiet, painstaking nature, and his delicately clever fingers equipped him well; he loved to breed the tiny creatures, and to work out their life-histories for his friend, who was then preparing his great work upon the subject. Thanks to what Stainton calls his "untiring energy," Thomas Boyd was successful in adding eleven new species to the "British List" between 1853 and 1858, five of which were new to Science. The new species were:—

*Gelechia ocellatella*, Boyd; taken at the Lizard, Cornwall (Weekly Int. vol. iv. p. 143, and Ent. Ann. 1859, p. 151).

*Glyphipteryx schenicolella*, Boyd = *jischeriella*, Zell.; bred from the Lizard (Weekly Int. vol. iv. p. 144, and Ent. Ann. 1859, p. 153).

*Nepticula prunetorum*, Sta.; bred from Loudwater, Bucks (Ent. Ann. 1855, p. 72, second edit.).

*Nepticula atricollis*, Sta.; bred (Ent. Ann. 1857, p. 112).

*Nepticula luteella*, Sta.; bred (Ent. Ann. 1857, p. 110, and 1866, p. 37).

And the species new to Britain:—

*Diasemia ramburialis*, Dup.; taken at Probus, Cornwall (Ent. Ann. 1859, p. 149, with fig.).

*Platyptilia zetterstedtii*, Zell.; taken at Lynmouth, Devon (Ent. Ann. 1856, p. 44).

*Gelechia arundinetella*, Sta.; bred from near Hackney (Weekly Int. vol. ii. p. 139, and Ent. Ann. 1858, p. 91).

*Gelechia leucomelanella*, Zell.; bred from the Lizard, Cornwall (Ent. Ann. 1859, p. 150).

*Coleophora limosipennella*, Fisch. & F. v. R.; bred (Ent. Comp. p. 133, and Ent. Ann. 1855, p. 67).

*Nepticula arcuatella*, H. S. = *N. arcuata*, Frey; bred (Ent. Ann. 1858, p. 97).

He also was the first to rear *Coleophora inflatæ*, Sta. (Ent. Ann. 1857, p. 105).

But Thomas Boyd was no narrow specialist; he took a broad view of Nature, the study of which was ever to him "the contemplative man's recreation"; in particular he was also a good field botanist, a conchologist, and a microscopist. And though he never wrote much, soon after the publication of the 'Origin of Species' in 1859, he felt compelled to champion Darwin's theories in an interesting article on the subject, which he contributed to the leading entomological journal of those days, the 'Weekly Intelligencer' (vol. ix. p. 149), because, he says, Darwin "has received such a scant measure of fair play in your pages."

Thomas Boyd married Sarah Harriette Stone (daughter of the Rev. William Stone, M.A.) in 1864, and leaves two sons and three daughters. About thirty years ago he handed over the best things in his collection of Lepidoptera, including the above-named types, to his cousin, the late William Christopher Boyd, of The Grange,

Waltham Cross (Ent. Mo. Mag. vol. xliii. p. 16), in whose cabinets they still remain.—W. G.

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#### PETER CAMERON.

PETER CAMERON is dead, as was announced by most of the halfpenny papers on December 4th. What can we say of his life? Nothing; for it concerns us in no way. What shall we say of his work? Much; for it is entirely ours, and will go down to posterity as probably the most prolific and chaotic output of any individual for many years past. The analogy between his writings and those of Francis Walker is remarkable: both contained excellent, close and conscientious investigations in their earlier stages, and towards the last became the most obvious scourgings of a badly balanced mind. In the latter respect Walker was by far the more blameworthy, for he was a cultured gentleman, and could have no excuse for such lamentable deterioration, whereas in our subject's case one is simply left wondering at the multitudinous, though usually quite short, papers annually found beneath his name in the 'Zoological Record.' Probably his best work is that by which alone he will be known at home, his 'British Phytophagous Hymenoptera,' published by the Ray Society many years ago. But already in the Hymenopterous part of the 'Biologia of Central America' lapses are numerous; and, by the time that Hymenoptera Orientalia appeared, we see him to have quite given up any attempt at systematics, and ignoring all palæarctic authors, of whom he never possessed an intimate acquaintance, he launches forth to erect a disjointed classification of his own. From first to last his ignorance of European literature was deplorable, and from one of his first papers upon exotic forms (Trans. Nat. Hist. Soc. Glasgow, 1883, p. 272, in which the abundant European *Ichneumon leucomelas* of Gmelin, 1790, is brought forward as new under the name *Amblyteles ludovicus*) to the last one published before his death (Proc. Linn. Soc. N.S. Wales, 1912, p. 187, in which the South European *Campoplex canescens* of Gravenhorst, 1829, is brought forward as new under the name *Amorphota ephestie*) synonymy is rife. We trust the powers that be will acquire the hundred and twenty boxes said to have been found in his lodging, since types alone can, and that but slowly, rectify the chaos created.

CLAUDE MORLEY.

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WITH much regret we have to announce the death, on November 29th last, of Monsieur GEORGES CÉLESTIN EDOUARD BRABANT, of Cambrai (Nord), in his sixty-fourth year. Although nearly all branches of natural history received his attention, he devoted himself largely to the collection and study of Lepidoptera; he published descriptions of new species, belonging to this order, from French Guinea, one of the many countries that he visited to acquire material and knowledge.

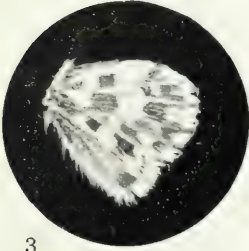




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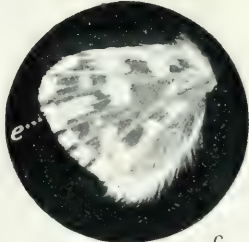
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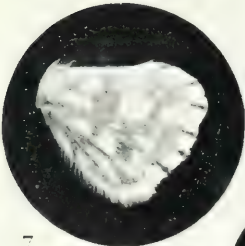
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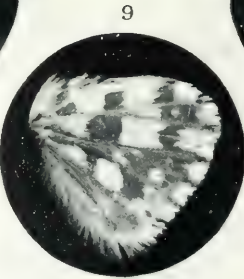
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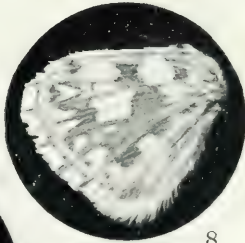
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Phototype, Sadag, Geneva.

West, Newman proc.

DISTINCTIVE WING CHARACTERS OF HESPERIIDÆ.

- |                                |                              |                                  |
|--------------------------------|------------------------------|----------------------------------|
| 1. <i>H. fritillum</i> , Hb.   | 2. <i>H. alveus</i> , Hb.    | 3. <i>H. armoricanus</i> , Obthr |
| 4. <i>H. fritillum</i> , Hb.   | 5. <i>H. onopordi</i> , Rbr. | 6. <i>H. carlinæ</i> , Rbr.      |
| 7. <i>H. serratulae</i> , Rbr. | 8. <i>H. carthami</i> , Hb.  | 9. <i>H. alveus</i> , Hb.        |



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## FURTHER NOTES ON HESPERIID CLASSIFICATION.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Concluded from p. 11.)

(PLATE III.)

WHEN I drew up my table of the genus *Hesperia* (p. 11, *antea*), I had not seen M. Charles Oberthür's contribution on the subject to the 'Feuilles des Jeunes Naturalistes' (December, 1912, pp. 169-170). So far as it concerns this particular group, I note that his conclusions take form and shape very much as I present my own. He maintains *H. alceus* var. *ruffelensis* as a separate species, and brackets *H. bellieri* with var. *foulquieri* as doubtful forms of the same species. But until we know more of the comparative life-histories, the imaginal habits, and the geographical distribution of the three it would be as well to keep them under the several head-species suggested. Meanwhile, M. Oberthür appeals to French naturalists to assist him with facts, and we may hope that he will be successful, though, judging from the paucity of notes on Lepidoptera in the 'Feuilles des Jeunes Naturalistes,' the number of workers, or at all events of those who communicate their views and observations on the subject, is not particularly encouraging. I venture, therefore, to supplement the appeal by a request to English entomologists resident in Switzerland to co-operate with our Swiss colleagues. Good life-histories of nearly all the Continental Hesperiidæ are a desideratum.

To resume the subject of the identification of the respective imagos of the genus *Hesperia*, I have the permission of Prof. J. L. Reverdin, Dr. Charles Blachier, and M. Marcel Rehfous to reproduce for the readers of the 'Entomologist' a plate recently published in the 'Bulletin de la Soc. Lépid. de Genève' (vol. ii. fasc. 3, pp. 171-172, July, 1912), which shows with admirable clearness the most important distinctive characters of the several species under review. I thank these gentlemen most heartily for their generosity, and congratulate them at the

same time upon the success which has attended their investigations. Further, I think that if ever there were a case where the advantage of M. Oberthür's contention in favour of priority in nomenclature by illustration were demonstrated, it is that of these Hesperiidæ. What endless speculations and tangles might have been avoided had the original authors presented their descriptions in each case, with an *accurate* figure showing the distinctive characters of their several species! The Brussels Congress was so far in agreement on the subject of nomenclature as to resolve that "it is desirable that descriptions be accompanied by figures." M. Oberthür, at Oxford, would have us go one step further. In the course of an eloquent speech on the subject, he said:—"Je demande que ce vœu soit complété comme suit; il paraît nécessaire pour empêcher la confusion de la Nomenclature que désormais chaque description d'Espèce soit accompagnée tout-à-moins d'une reproduction photographique, qui devra être publiée au plus tard un an après l'impression du texte de la description."

#### DISTINCTIVE WING CHARACTERS OF HESPERIIDÆ (Plate III.).

**ALVEUS.**—Fore wing, upper side: Intradiscoidal spot concave towards the outer margin (fig. 2, *b*). Hind wing, under side: Prolongation of the anal angle; median band wide; internal edge of the band rectilinear; ground colour olive-yellow, slightly marbled, or unicolorous (fig. 9).

**CARLINÆ.**—Hind wing, under side: Lengthening of the anterior border; extended white marginal rectangle in intraneural spaces 4 and 5 (fig. 6, *e*).

**FRITILLUM** (= **CIRSII**, Rbr.).—Fore wing, upper side: Intradiscoidal spot rectilinear, and often thickened (*Delahaye's mark*, fig. 1, *a*). Hind wing, under side: Reddish, or olivaceous coloration strongly marbled, with deeper coloured spots; nervures very prominent and usually reddish; white spots with pearly reflections (fig. 4).

**ONOPORDI.**—Hind wing, under side: Anvil-shaped spot in median band (fig. 5, *c*); hooked spot from outer margin (*Blachier's mark*, fig. 5, *d*).

**ARMORICANUS.**—Hind wing, under side: Greyish or reddish tint, lightly marbled, and with deeper coloured spots; median band narrow; nervures clearly distinct (fig. 3).

**SERRATULÆ.**—Hind wing, under side: Uniform greenish yellow; white spots very distinct in depth, and without edging or pearly reflection (fig. 7).

**CARTHAMI.**—Hind wing, under side: White spots without pearly reflections, and surrounded by fine dark border (fig. 8).

## CHIEF POINTS FOR DIFFERENTIATION OF SPECIES.

- |    |                           |   |
|----|---------------------------|---|
| 1. | <i>alveus</i>             | } Pronounced prolongation anal angle hind wing.   |
|    | <i>armoricanus</i>        |   |
|    | <i>carlinæ</i>            | } Less pronounced.  |
|    | <i>onopordi</i>           |   |
|    | <i>fritillum</i>          | } No prolongation.  |
|    | <i>serratulæ</i>          |   |
|    | <i>carthami</i>           |   |
| 2. | <i>alveus</i>             | } Intradiscoidal spot, upper side fore wing, crescent-shaped.   |
|    | <i>carlinæ</i>            |   |
|    | <i>onopordi</i>           |   |
|    | <i>serratulæ</i>          |   |
|    | <i>armoricanus</i>        |   |
|    | <i>carthami</i>           | } Rectilinear ( <i>Delahaye's mark</i> ).   |
|    | <i>fritillum</i>          |   |
| 3. | <i>alveus</i>             | } Median band, hind wing under side, broad.   |
|    | <i>carthami</i>           |   |
|    | <i>carlinæ</i>            | } Median band narrow.   |
|    | <i>fritillum</i>          |   |
|    | <i>onopordi</i>           |   |
|    | <i>armoricanus</i>        |   |
|    | <i>serratulæ</i>          |   |
| 4. | <i>armoricanus</i>        | } Internal edge of spot in space 4 5 of the median band, under side hind wing, rectilinear. (Occasional exceptions in <i>alveus</i> and <i>serratulæ</i> .) |
|    | <i>serratulæ</i>          |   |
|    | <i>alveus</i>             | } Variable.   |
|    | <i>fritillum</i>          |   |
|    | <i>carlinæ</i>            | } Never rectilinear.  |
|    | <i>onopordi</i>           |   |
|    | <i>carthami</i>           |   |
| 5. | <i>alveus</i> (pro parte) | } Under side hind wing, unicolorous.  |
|    | <i>serratulæ</i>          |   |
|    | <i>fritillum</i>          | } Marbled.  |
|    | <i>carlinæ</i>            |   |
|    | <i>onopordi</i>           |   |
|    | <i>armoricanus</i>        |   |
|    | <i>carthami</i>           |   |
|    | <i>alveus</i> (pro parte) | } Slightly marbled.   |
|    |                           |   |
| 6. | <i>fritillum</i>          | Nervures, under side hind wing, very distinct.  |
|    | <i>carlinæ</i>            | } Rather distinct.  |
|    | <i>onopordi</i>           |   |
|    | <i>armoricanus</i>        | } Hardly, or at all.  |
|    | <i>alveus</i>             |   |
|    | <i>serratulæ</i>          |   |
|    | <i>carthami</i>           |   |
|    |                           | Not at all.   |

It will be observed that I have not included, nor do the authors of the papers cited include, the species *Hesperia bellicri*, Obthr., but I understand that there is now material in hand to go to work in the same methodical manner, and that the characteristics of this new-old Hesperiid will be published later.

Harrow Weald: January 4th, 1913.

## SOME ABERRATIONS OF BRITISH LEPIDOPTERA.

### *EUCHLOË CARDAMINES.*



THE above curious aberration of *Euchloë cardamines* was taken at Cock Clarks, a village near Danbury, Essex, on June 5th, 1911. It differs from the type by the complete absence of black scales, including the powdering at the base of the fore wings and the typical discal spot. The green mottling on the under side of the hind wings is only just traceable, giving place to yellow. The size is quite normal. With the exception of a small piece out of the hind wing the specimen is quite perfect.

L. C. HOCKING.

6, Royal Mint, Tower Hill, E.

### *PARARGE MEGÆRA.*

(PLATE IV., FIG. 4.)

THE butterfly figured is a somewhat uncommon aberration of female *P. megæra*, taken by myself at Aldbury, near Tring, on August 5th, 1907.

The interesting point about the insect is the large number of ocellated spots on the fore wings. It will be noticed that the





Photo D. P. Betts. Fig. 4.



5



6

Photo J. Snelan

Photo H. Main.



Photo H. Main.

West, Newman proc.



usual eye-spot near the apical angle is distinct and well-marked, and just below it is a smaller spot which shows a tendency to coalesce; while nearer the apex is the small spot which is frequently met with in normal specimens. A fourth well-defined spot lies below the two coalesced spots, and below this lies a dot, which does not show in the photograph. On the under side the four above-mentioned eye-marks are present, while the hind wings present quite a normal appearance both on the upper and under sides. It may be interesting to note that in the allied Continental species, *S. mæra*, the eye-spot on the fore wings has generally two white pupils.

Tutt ('British Butterflies,' p. 393) mentions another aberration, as follows: "On the hind wings there are usually four ocellated spots, sometimes, however, only three, but in one female specimen that we have the spot nearest the anal angle is double, and there are two small spots in the upper fulvous patches of the series, making a total of seven."

D. P. BETTS.

13, First Avenue, Hoe Street, Walthamstow.

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### PLUSIA MONETA.

(PLATE IV., FIGS. 1, 2, aberration; FIG. 3, typical.)

ABERRATIONS of *P. moneta* are so extremely rare that it may be well to figure those of which I enclose photographs in the 'Entomologist.' As will be seen, there is a general darkening of the ground colour compared with that of typical specimens, but the striking feature of the aberration is the very remarkable wedge-shaped *black* spots in the marginal area.

These specimens were two of twenty-six reared from larvae collected in a garden at Boxmoor, Herts, this year, and they emerged within twenty-four hours of one another.

Mr. Prout tells me that, as far as he knows, this form of aberration has not been known before.

G. H. HEATH.

277, Brockley Road, S.E.

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### VENILIA MACULATA.

(PLATE IV., FIG. 5.)

I SEND you herewith a photograph of a remarkable aberration of *Venilia maculata*. I caught the moth in Pamber Forest, near Reading, on June 1st, 1905, but the opportunity of having it well photographed did not occur till I was fortunate enough to meet Mr. H. Main down here this summer. Mr. Main, with great courtesy and kindness, expended his well-known skill in taking the photograph which is here reproduced.

The specimen is a female in perfect condition. The entire fore wing, save the hind margin, is suffused with a golden green, rather more golden in colour than the dark spots on the type specimens. The hind wing is slightly darker in colour and the gold dusting is less apparent. On the hind margin of each is just a trace of the ordinary light yellow markings; they appear well on the fore wings in the figure. Without those traces I should have hesitated in finding a name for the moth, which is extremely beautiful.

Fig. 6 represents a typical example of the species.

J. S. CARTER.

Warren Hill Cottage, Eastbourne.

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### ACIDALIA VIRGULARIA.

(PLATE IV., FIG 7, melanic form; FIG. 8, grey form.  $\times 2$ .)

IN September, 1911, I had the good fortune to capture a melanic specimen of *Acidalia virgularia*, at rest on a fence in one of the south-east suburbs of London. Fortunately the specimen, though unusually small, was a female, and a few ova were obtained. The larvæ were successfully wintered, and twenty-three perfect (and one crippled) specimens emerged at the end of May, 1912.

The grey specimens of this melanic race are perfectly distinct from the melanic forms, and none of those reared so far can properly be called intermediates. There is, however, a stronger or weaker tendency to develop a dark suffusion towards the margin of both wings, giving the outer band the appearance of frosted silver, very different from the usual London type. In other words, the grey forms of this race suggest that the influence of the melanic strain is producing a suffusion of dark scales along the outer border of both wings.

The upper wing area of the melanic specimen is entirely suffused with these dark scales, with the exception of a small but slightly variable area surrounding the dark discoidal spots. The extreme edges of the wings and fringes appear to be white, but of course they show up more vividly than in the type form, owing to contrast.

The spaces between the eyes and the front of the thorax are white, as well as a basal spot on each wing.

The anal tufts and a narrow fringe of scales at the junction of the abdominal segments remain white, but the ventral area of the abdomen is distinctly affected by the melanism, whereas the legs are not noticeably darkened.

The black scaling would produce as black a moth as var. *doubledayaria* of *Pachys betularia* were it not that the wings are



more delicate, and that the scales on the under surface are not black but only slightly darker than in the type-form, producing a greasy effect.

Mr. Prout tells me that this form, though generally less extreme, is known on the Continent as var. *bischoffaria*.

R. T. BAUMANN.

108, Station Road, Chingford, Essex.

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[Melanic specimens of *Acidalia marginepunctata* and *A. subsericeata* are figured in the 'Entomologist,' vol. xl. p. i.—ED.]

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## NEUROPTERA, &c., FROM THE SOUTH OF FRANCE.

BY W. J. LUCAS, B.A., F.E.S.

DR. T. A. CHAPMAN, with his usual kindness, handed over to me a small collection of interesting insects which he took in the South of France in June and July last. No fewer than five Natural Orders are represented by the twenty-three species contained in the collection. For assistance in the identification I have to thank Mr. K. J. Morton and Rev. A. E. Eaton. The insects are:—

### Plecoptera.

\**Perla cephalotes*. Courmayeur, June 21st–July 8th.

*Dictyopteryx alpina*. Val d'Isère, July 10th–24th, and Courmayeur.

\**Nemoura variegata*. Courmayeur.

\**N. inconspicua*. Val d'Isère.

### Ephemeroptera.

\**Ecdyurus venosus*. A female imago: Brides-les-Bains, June 8th–15th.

### Odonata (Paraneuroptera).

\**Sympetrum fonscolombii*. Two females; Val d'Isère.

\**Orthetrum cærulescens*. One female; Brides-les-Bains.

### Neuroptera.

*Myrmecleon formicarius*. Two; Brides-les-Bains and Courmayeur.

*Raphidia flavipes*. Two; Courmayeur. Wings not quite typical.

\**Hemerobius quadrifasciatus*. Two; Courmayeur.

\**Chrysopa perla*. Four; Courmayeur.

*Panorpa communis* var. *vulgaris*. One male and five females; Courmayeur. Though there was but one male, all apparently should be referred to this species and variety.

### Trichoptera.

*Drusus muelleri*. Male and female; Val d'Isère.

*D. melanchætes*. Male; Val d'Isère.

*D. discolor*. Male; Val d'Isère.

- Sericostoma pedemontanum*. Courmayeur.  
*Beriea maurus*. Female; Courmayeur.  
*\*Hydropsyche pellucidula*. Female; Brides-les-Bains.  
*\*H. fulvipes*. Female; Brides-les-Bains.  
*Philopotamus ludificatus*. Courmayeur and Brides-les-Bains.  
*Rhyacophila torrentium*. Two males and two females; Val d'Isère and Brides-les-Bains.  
*R. vulgaris*. A male; Courmayeur.  
*R. tristis*. A female; Courmayeur.

Those with an asterisk (\*) are found in the British Isles also.  
 Kingston-on-Thames: January, 1913.

## DIAGNOSES OF SOME AMERICAN ACRÆINÆ.

BY DR. K. JORDAN.

### 1. *Actinote eresia leptogramma*, subsp. nov.

♂. Alarum anticarum triente vel dimidio apicali nigro fascia maculari aurantiaca notato; alis posticis nigro marginatis.

♀. Alis anticis ad basin nigro suffusis; posticis totis nigris.

*Hab.* Baños, Pastaza, Ecuador.

### 2. *Actinote desmiala*, sp. nov.

♂. Alis anticis nigris, macula magna basali et fascia discali aurantiacis; posticis nigris fascia media aurantiaca antice dilutiore.

*Hab.* Archidona, Ecuador. Male in Mus. Brit.

### 3. *Actinote diceus flavibasis*, subsp. nov.

♂ ♀. Alis posticis subtus ad basin flavis.

*Hab.* Eastern Cordillera of Colombia.

### 4. *Actinote leontine bulis*, subsp. nov.

♂. Alis anticis macula cellulari nigra et fascia discali ochraceo-flava; posticis margine exteriori nigro angusto postice tenuissimo. Anticis subtus ad apicem luteo-griseis nigro striatis.

*Hab.* Zamora and Loja, South-eastern Ecuador (O. T. Baron).

### 5. *Actinote stratonice æreta*, subsp. nov.

♂. Alarum anticarum macula nigra discocellularis magna cum margine costali nigra conflua. Posticarum prona facies a basi fere ad medium aurantio-rufi striata, striis in cellula pallidioribus.

*Hab.* Zamora, South-eastern Ecuador (O. T. Baron).

### 6. *Actinote alalia conspicua*, subsp. nov.

♂. Subspecies major, saturatius colorata, fascia discali alarum anticarum atque margine posticarum nigris latis; alis posticis subtus omnino fulvo-aurantiacis nigro striatis.

*Hab.* Rio de Janeiro.

7. *Actinote cedeſtis*, spec. nov.

♂ ♀. Speciei *anteas* dictæ affinis, ſubtus ut in hac ſpecie abſque ſerie ſetarum in alarum poſticarum cellula; maculis alarum anticarum pallidius ſtramineis; alis poſticis in diſco plus minusve fulvis aut totis ſtramineis, margine ſat lato nigro.

*Hab.* Zamora, South-eastern Ecuador (O. T. Baron).

8. *Actinote crassinia eupelia*, subsp. nov.

♂ ♀. Pallidior quam *A. c. crassinia* et *terpsinoë*, alis poſticis fortius nigro ſtriatſis; anticis ſubtus ad apicem colore griseo-luteo alarum poſticarum.

*Hab.* Province Sara, Dept. Santa Cruz de la Sierra, Eaſt Bolivia, March-April, 1904 (J. Steinbach).

9. *Actinote parapheles*, spec. nov.

♂ ♀. *A. pyrrhæ* affinis, ſed area fulvo-aurantiaca baſali alarum anticarum bene expreſſa, haud obſoleſcente.

*Hab.* Rio de Janeiro (E. May).

Ab *A. anteante* differt cellula alarum poſticarum ſubtus ſemper ſerie ſetarum inſtructa.

10. *Actinote pellenæ crucis*, subsp. nov.

♂ ♀. Signaturis bene expreſſis, area baſali fulvo-aurantiaca alarum anticarum magna antice et extus plus minusve ſtraminea, fascia ſubapicali quoque ſtraminea.

*Hab.* Dept. Santa Cruz de la Sierra, Eaſtern Bolivia (J. Steinbach).

11. *Actinote pellenæ calymma*, subsp. nov.

♂ ♀. Signaturis plus minusve diffuſis, arearum nigrarum colore minus ſaturato quam in *pellenæ* et *cruce*.

*Hab.* Sapucay, Paraguay (W. Foſter).

12. *Actinote perisa*, spec. nov.

♂ ♀. Alis omnino luteis, marginibus anguſtiſſime fuscis; anticis macula cellulari et utriſque alis fascia diſcali nigris notatis, his ſignaturis ut in *A. ſurima* poſitis ſed anguſtioribus.

*Hab.* Tucuman (J. Steinbach).

All theſe forms will be figured and more fully dealt with in vol. v. of Seitz's 'Macro-Lepidoptera.' As I ſhould like to include theſe forms in Wagner's Cat. Lep., ſubf. Acræinæ, which will probably be iſſued prior to the fascicles of Seitz's vol. v. containing *Actinote*, the publication of the above ſhort diagnoses is neceſſary in order to avoid *nomina indeſcripta*.

## SOME ORIENTAL BEES.

By T. D. A. COCKERELL.

*Halictus (Erytæus) kandiensis*, sp. n.

♀. Length about or a little over 6 mm., anterior wing slightly over 5 mm.: pure black, the scanty and short hair of head and thorax dull white: head broad-oval, face narrowed below, vertex and cheeks normal, but ocelli remote from eyes; scape long, flagellum very dark brownish beneath: front dull, supraclypeal area and clypeus moderately shining, clypeus produced; mesothorax dullish and granular, but shining at sides; scutellum shining; postscutellum densely tomentose basally; area of metathorax large, covered all over with very fine longitudinal striæ, producing a file-like effect; posterior truncation rather small, its margins above the middle rounded; tegulæ shining dark reddish: wings strongly dusky, reddish, stigma and nervures piceous, stigma large, first r. n. meeting second t. c.; hind spur with a few long teeth; abdomen shining, slightly granular, but a lens shows no punctures; second and third segments with narrow white basal bands, feeble in the middle, but not much broadened at sides; second to fourth segments, except in middle, with thin inconspicuous apical hair-bands; apical margins of segments faintly brownish. Microscopical characters: clypeus minutely roughened, with sparse piliferous punctures; front minutely rugulose, with excessively minute well separated punctures; mesothorax very feebly sculptured, minutely tessellate, with scattered minute punctures; area of metathorax quite dull, the minute striæ (more properly raised lines) very regular; abdomen finely transversely lineolate.

*Hab.* Kandy, Ceylon, February, 1910 (*E. Comber*). British Museum.

Runs in Bingham's tables (*Fauna Brit. India*) to the vicinity of *H. timidus* (which has a rufo-testaceous abdomen) and *H. gutturosus* (which has a small, rugose, metathoracic area, and clear wings). It is also to be compared with *H. torridus*, Cam., which has clear hyaline wings, with pale nervures. The sculpture of the metathorax suggests *H. ceylonicus*, Cam., which, however, is larger, and has brassy tints.

*Allodape picitarsis*, Cameron.

Bingham does not record *Allodape* from Ceylon, but Mr. Comber took a female of this genus at Sigiri in that island, March, 1910. It is *A. picitarsis*, described from the Leccadive Islands, as I have determined by means of a cotype of Cameron's species in my collection.

*Tetraloniella calidula*, sp. n.

♂. Length about 11 mm.: flagellum 8 or almost; anterior wing 7½; black, covered with light fulvo-ochraceous hair, nowhere mixed with black, but ferruginous on inner side of basitarsi; clypeus entirely lemon-yellow, densely rugoso-punctate; labrum yellow; mandibles ferruginous apically, basally black with a very large triangular yellow



patch; malar space a mere line; eyes pale ochraceous; facial quadrange higher than broad; scape black, reddish apically; flagellum entirely bright ferruginous; third antennal joint about as long as its apical width; mesothorax densely punctured; thorax above, especially the scutellum, with dense hair; tegulae pale ferruginous with a dusky basal spot, their surface covered with short reddish hair; wings rather short, dusky, the basal half evidently reddish, stigma and nervures ferruginous; first r. n. joining second s. m. near end; legs black, densely clothed with ochraceous hair, apical joints of tarsi red; abdomen robust, densely clothed with felt-like fulvo-ochraceous hair; first segment with the usual long hair, but apical part broadly clothed with very short appressed hair, having in some lights a darker, yellowish-brown colour; apical margin of second segment with the same brown colour, but very narrowly; apical plate broad, truncate; fifth and sixth segments with lateral spines, which are not conspicuous.

*Hab.* Andheri, Salsette, India, Sept. 13th, 1908 (N. B. K.). British Museum. I have not ventured to extract the mouthparts of the unique type, but the reference to *Tetraloniella* seems safe. The species is nearest to *T. punctata* (Cam.), differing by the larger size, and having the abdomen entirely covered with fulvo-ochraceous hair. The insect reminds one of some of the American species of *Xenoglossodes*, although differing much in detail. The marginal cell is shorter and more obtuse apically than in *Xenoglossodes*.

*Nomia nursei*, Cameron.

A male collected by Mr. Comber is labelled "Secdbd.," which I take to mean Secunderabad, India.

*Nomia parciformis*, sp. n.

♂. Length about 8 mm., anterior wing a rather scant 7: black, the head and thorax with rather coarse yellowish-white hair, the dense hair of the face distinctly yellowish; head broad; mandibles rather stout and not especially long, reddish about the middle; front striate; vertex rugulose; scape black, minutely roughened; flagellum long, lively ferruginous beneath; third and fourth antennal joints equal; mesothorax with very fine and close punctures, but shining between; scutellum more shining, the punctures not so close; basal area of metathorax with delicate longitudinal rugae; postscutellum densely covered with dull white hair; tegulae translucent reddish-testaceous, not enlarged; wings long, reddish hyaline, stigma and nervures ferruginous; second s. m. very small, a little higher than wide, receiving first r. n. beyond the middle; femora black with the knees red, hind femora slender and simple; tibiae red, the middle and especially hind pair broadly suffused with black; hind tibiae simple, the outer side dark, with a bright chestnut-red apical patch, the anterior margin bulging a little before the apex, but without the distinct angle seen in *N. parca*, Kohl; tarsi long, clear ferruginous, the hind basitarsi yellowish-white; abdomen rather broad, inclined to be subclavate, but the basal segment a little broader than long; surface



of abdomen shining, somewhat sericeous, the first segment with evident but excessively minute punctures; hind margins of segments broadly translucent reddish, covered by dense white hair-bands, which in the type are largely abraded in the middle; fourth ventral segment remarkable for a covering of fine tomentum, which in the middle is orange-fulvous; apex of abdomen beneath with fulvous hair.

*Hab.* Nasik, India (*E. Comber*). British Museum. A species of the group of *N. parca*, Kohl, allied to the Indian *N. parcella*, Ckll., and *halictura*, Ckll. From *parcella* it is known by the larger size, and details of the legs and wings. It cannot well be the undescribed male of *N. halictura*, owing to the differences in venation, &c.; or, at least, the differences are such that it seems quite unsafe to assign it to *halictura*. In Bingham's tables it falls near *N. rustica*, Westwood, which has subtriangular hind tibiae.

*Nomia leucoptera*, sp. n.

♀. Length 7 mm., anterior wing about  $6\frac{1}{2}$ ; head and thorax black (metathorax behind, and metapleura, reddish) with greyish-white hair, the fringe on lower edge of clypeus shining and golden-tinted; abdomen rufo-fuscous; tegulae small, translucent testaceous; wings clear, iridescent, almost milky; the large stigma and the nervures pale testaceous; legs pale brownish-testaceous, with glittering hair. Head large, transversely oval, facial quadrangle very much broader than long, eyes small, cheeks broad; mandibles long, brown in middle; clypeus and front shining, the sides of front obscurely striate; the microscope shows only piliferous punctures on front and face: sides of vertex shining, with minute punctures; scape long, curved, dark brown, fulvous at base; flagellum clear ferruginous beneath, dusky above; mesothorax shining, with sparse extremely minute punctures; scutellum smooth and shining; postscutellum covered with white felt-like hair; area of metathorax scarcely defined, very narrow at sides, with slight indications of ridges; second s.m. square, receiving first r. n. in middle; third s. m. not nearly as long as first; hair on inner side of hind tarsi light golden; abdomen shining, with extremely minute widely separated punctures, the hind margins of segments testaceous, and with thin white hair-bands, obsolete on the first, except at extreme sides, interrupted on the second; middle of apical segment with appressed golden hair.

*Hab.* Karachi, India (*E. Comber*). British Museum. This looks like another member of the *parca* group, but it differs greatly from *parciformis* by its clear wings and much shorter third submarginal cell. From *N. parcella*, Ckll., it is readily known by the much broader face and paler legs.

*Andrena nursei*, n. n.

*Andrena halictoides*, Nurse, Jun., Bombay Nat. Hist. Soc. xv. p. 566 (not of Smith)—Peshin.

# FURTHER NOTES ON *METRIOPTERA ROESELII* [ORTHOPTERA].

BY HERBERT CAMPION.

BRITISH records of *Metriopectera roeselii*, Hagenb., are multiplying rapidly. Since the publication of my remarks in the last volume of this magazine (p. 117), the species has been made known from the North Essex coast (*l. c.* p. 207) and from near Gravesend (p. 224). In addition to these and the other known localities, there are two new ones on the south coast of Essex, where the insect was met with during 1912 by my friend Mr. A. Luvoni, of Westeliff. At one of the new localities it was first noticed on July 21st, when it occurred in some numbers in a place covered with rank vegetation. The captures made on that occasion, which I have seen, included imagines of both sexes, although most of the females were still nymphs. Thereafter, specimens continued to be taken, at intervals, until September 22nd, when the last were obtained. July 21st is the earliest and September 22nd is the latest of the exactly dated records for imagines with which I am acquainted. Two males procured on the last-named date survived in captivity until September 28th and October 12th respectively. At the second of the new Essex habitats, which is well removed from the first, two females were taken on July 24th. Notwithstanding the fact that imagines were met with some time before the end of July, a female nymph was taken at Herne Bay so late in the summer as August 28th.

It will be observed that the new localities which have been discovered recently are all of them situated, like those previously known with certainty, either at the mouth of the Thames or on the East Coast south of the Humber. On the Continent of Europe, however, the species is not a littoral one, and its distribution is very general. Dr. Malcolm Burr is kind enough to write (*in litt.*):—"It usually occurs in grassy meadows. I have taken it in Bosnia, in the mountains of Hercegovina, in the Park of Fontainebleau, and at Tübingen in Württemberg, and I have specimens from 6000 ft. in the Caucasus, from the Vosges, and the Carpathians. It occurs practically throughout France, and perhaps crosses the frontier into the Spanish Pyrenees. It occurs as far north as Sweden, and at least as far east as the Urals."

Early in September last Mr. George T. Porritt visited Mr. Wallis Kew's old locality on the Lincolnshire coast, and found the species plentiful there. I learn, through Mr. Porritt's courtesy, that he did not observe a single specimen, of either sex, having the colour of the prothoracic border otherwise than bright grass green.

At the end of August I was fortunately able to renew my own

acquaintance with *M. roeselii* in a state of nature. A visit to a locality near Herne Bay where it occurred many years ago—a slope overgrown with thistle, ragwort, and other plants—resulted in my detecting a few specimens, although the finding and taking of them was a matter of some difficulty.

The coloration of the male seems to be more constant than that of the female, and I have not seen a specimen having the hind femora otherwise than light brown. The most variable characters are the pleural and abdominal spots and the prothoracic border, which may be either bright grass green or bright yellow, or even some intermediate colour. In some specimens the pale brown summit of the head has a median longitudinal line of lighter colour, which may continue across the pronotum, bordered on each side with black.

A note was kept of the coloration of a female taken at Herne Bay on August 28th, which it may be useful to quote here, although, as will appear subsequently, the description did not apply, in several of its details, to other females which were examined in the living state:—

Face dark green. Palpi greenish. Eyes dark chestnut; a large black spot above each, crossed by a narrow line of yellowish running backwards from the eye. Antennæ chestnut. Upper surface of head and prothorax light brown, with a yellowish median longitudinal line, bordered on each side with black. Lateral lobes of prothorax black, edged all round with bright grass green. Elytra light brown, with the principal longitudinal veins black. Three large green spots on each side of the thorax. Tibiæ of the fore and mid-legs greenish. Femora of the fore and mid-legs, and the whole of the hind legs, light brown. External surface of the hind femur with numerous stout transverse black lines. Abdomen above and anal appendages light brown; sides of abdomen greenish; a row of greenish-yellow markings along each side of the abdomen; ventral surface light brown. Ovipositor mostly black.

In some of the adult females which I have seen alive, however, bright green has been very conspicuous in their coloration, especially as regards the femora of the hind legs, whereas in others the preponderating colour has been light brown.

At various times during August and September I succeeded in keeping two males and four females alive in captivity for periods ranging from six to twenty days. All, or nearly all, these specimens underwent a certain amount of change in their coloration, the green of the prothoracic border and of the lateral spots on the thorax and abdomen tending to become yellow, especially in the male, and the greenness of the fore and mid-legs giving place to light brown. In the two Essex males taken on September 22nd the colour of the border, at the time of



capture, was lemon-green. By the time one of them died, six days later, the border had become decidedly yellowish; in the case of the other male, which lived two weeks longer, practically all trace of green disappeared before death. In all instances the transition from green to yellowish began at the posterior margin of the border, and proceeded from behind forwards.

As throwing some light upon the direction taken by colour-development during the process of growth, I may mention that the female nymph obtained at Herne Bay on August 28th was very green indeed, and the green colour on the prothoracic lobe was not only present on the border, but invaded a considerable area of the lobe itself; moreover, the black in the same region was not at all intense or clearly marked off from the green portion. The venter is another region of the body that is subject to considerable variation in respect of colour. In some specimens it is light brown, while in other examples it is golden or light yellow.

All the living specimens which I have had under observation in captivity were enclosed in a large dry fish-globe kept indoors, and it is probable that, if they had been constantly exposed to the light as in a state of nature, the assumption of the fully adult coloration would have been more rapid and more complete. Again, it is not unlikely that the greenness of so many of the individuals taken in 1912 may have been due to the sunless weather which prevailed towards the close of the summer, and also to the circumstance that, during the same period, grass and other vegetation was kept particularly green by the constant rains.

Like Mr. South's Essex male of 1911, all the specimens which were kept alive were fed upon fresh grass, from which they ate readily until it became at all dry. In the evening of September 30th it was noticed that the last female then remaining was moribund or even already dead, but it was not removed at that time. The next morning it was unquestionably dead, and the femora of both hind legs had been partially eaten away, no doubt by the male which was still surviving. When at last the female was removed, it was seen that all the tarsi of the fore and mid-legs had been nibbled away. Similarly, the tarsi of both mid-legs had been eaten by other individuals in the case of a male found dead in the fish-globe on September 28th. That these insects do not mutilate themselves in their last moments is shown by the fact that such individuals as ended their lives in solitude suffered no damage of this kind. It is worthy of note, however, that all the specimens which died in captivity, whether kept with others or not, had their antennæ more or less broken. I have previously recorded instances of cannibalistic feeding on the part of *M. brachyptera*, and it now appears that the same habit is shared by *M. roeselii* also.



I could not discover that oviposition took place in the case of any of the females which I kept in captivity, notwithstanding the fact that one of them was actually observed to pair with a male. Two from Herne Bay were enclosed, either in glass-bottomed boxes, or in the dry fish-globe with grass scattered over the floor. At a later date two Essex females were kept, together with two Essex males, in the same globe after the floor had been covered with an inch or two of dry earth, upon which fresh grass was thrown day by day. At the proper time both the grass and the earth were carefully examined for eggs, but none could be found. One of the captive females was cut open after death, and upwards of a dozen eggs were taken from the abdomen. They were warm brown, elliptical bodies, with a smooth surface, and measuring about 4 mm. in length and 1 mm. in width. An egg-mass extracted by Mr. Luvoni from an Essex female taken on August 18th included several quite colourless eggs, as well as a few brown ones.

In conclusion, I must tender my best thanks to Mr. Luvoni for his readiness in collecting and supplying me with the material upon which much of the present paper is based.

58, Ranelagh Road, Ealing, W.

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## HIBERNATION OF PYRAMEIS ATALANTA.

By F. W. FROHAWK, M.B.O.U., F.E.S.

HITHERTO there appears to be no authentic instance on record of *P. atalanta* having been found in a state of hibernation in this country; it is, therefore, now a generally recognised belief that this butterfly, like its near ally, *P. cardui*, does not hibernate in the British Isles. But I am now able to place on record for the first time sufficient reliable evidence to prove that *P. atalanta* occasionally does successfully hibernate in Britain.

For the following very interesting facts I am greatly indebted to Captain E. B. Purefoy in supplying me with full data and details, of not only his own observations concerning the hibernation of *atalanta*, but also the most interesting facts of the observations made by Mr. Walter Barnes of Orpington, Kent. I may mention that Mr. Barnes is an experienced entomologist, therefore I give the facts as stated by him in his letter on the subject:—

“Three cases of apparent hibernation have come under my observation. The first and most interesting case is that in which one *atalanta*, two *io*, and two *urticæ*, were discovered quite accidentally by myself.

“In cutting back a rose tree which covered the side of the

house, one Saturday afternoon in February, 1907, two or three slates had become loose, and were hanging partly over the gutter; these I removed, and there were the butterflies in various positions clinging to the woodwork under the slates. *Atalanta* was in a horizontal position, the head only slightly lower than the body, the upper wings nearly covered by the lower pair. From the difficulty in removing it, I should imagine the hooklets and spines were both firmly embedded in the tiny interstices of the wood. The insect showed no signs of movement until it had been in a warm room for some time, when, after a considerable amount of vibration, it flew about the room. For some days it fed freely off moistened sugar, but died before the spring.

“(2) A gardener trimming a thick holly hedge near by in January, brought to me a holly branch on which were two sleeping *G. rhamni*, both males. The hedge was a very old one, and the dead leaves had accumulated in a thick mass through the middle, forming a rainproof covering to the lower portions, from which the *rhamni* were taken. The day following the gardener called me to look at another kind of butterfly in the same hedge. This turned out to be a very fine female *atalanta*, fixed head downwards on a dead leaf under the thick covering already mentioned. At the same time I found a female *rhamni* also attached to a dead leaf, which it very closely resembled. The last time I saw *atalanta* at rest was under the eaves of my house in early November, 1908. A week later when I went to examine it, I found only three wings, the insect had evidently been devoured. All three *atalanta* were females, and the position taken up was different in each case.”

The following notes are from Captain Purefoy's observations, with which he has been good enough to supply me.

“The summer and autumn of 1908 were chiefly devoted by us to experimenting with this insect (*atalanta*). Most of October was very warm, and *atalanta* had fine opportunities of feeding up. When the weather turned cold certainly a number of the insects became quite torpid while clinging to bark, which they greatly resembled. They remained very exposed, but not more so than *C. album*. Both at Christmas and in January, and again in March, they met with terrible weather. Twice the whole roof nearly collapsed under the weight of snow, and the temperature dropped to zero. But for the exceptional cold I am sure that at least a dozen insects would have survived our long winter. We started with about a hundred. As it was, two beauties were seen flying strongly in February, and three others actually survived the whole winter. They worked out their own salvation.

“The female *atalanta* is the strongest and most vigorous butterfly I know, and, although our winter climate is unsuited to the species, I am sure that an occasional female does survive.

Very likely these females have paired. It is difficult to prove. The male has not much staying power."

Captain Purefoy also tells me that the *atalanta* under his notice, which were flying about in his garden, declined to use the shelters provided for the hibernating butterflies, but remained throughout the winter quite in the open. After feeding till the end of October, they settled down for hibernation under the water shoots, or under the stouter limbs of trees. When clinging close to the bark of an old plum tree they were extremely difficult to see. Bright days always brought some out, so their numbers became gradually thinned. Two very perfect specimens appeared on a warm day at the end of February, and flew strongly all the morning; in the end we were unable to trace them. The warm days in April found three survivors.

## BRITISH ORTHOPTERA IN 1912.

BY W. J. LUCAS, B.A., F.E.S.

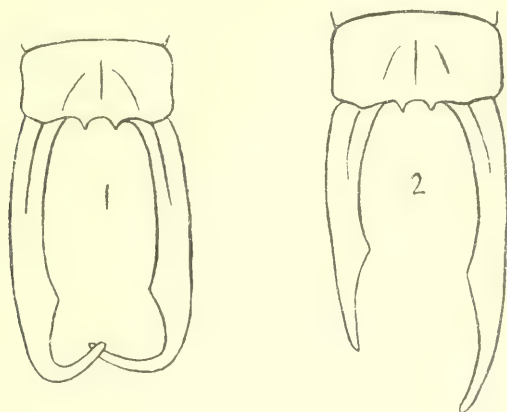
THOUGH no facts of first-rate importance have come to hand in connection with our Orthoptera during the past year, yet a few observations with regard to the habits of these insects have been made, and some little fresh knowledge has been gained as to their distribution in the British Isles. These are recorded in the present short paper.

**Forficulodea.**—On August 20th myself and a friend, H. G. Eldon, sought for the Great Shore Earwig (*Labidura riparia*) on the coast near Southbourne in Hampshire. After a rather lengthy quest we managed to obtain four, a male and a female from under the same shelter, and two females singly: one of the females was set free. When exposed to the light they all (or most) assumed the "threatening attitude," with callipers thrown forward over the back, and remained still, not trying to escape. In the evening, by artificial light, some nearly raw meat was given them, and the male at least ate of it freely. One of the females was noticed scratching briskly with mid and fore legs in the sand that had been placed in the box with them, as if with intent to burrow. The male, which at some time had received an injury, was moribund on August 24th, and one of the females was in the same state on August 31st; the remaining female was given alive to Mr. G. T. Porritt on September 11th.

On August 26th we again visited the locality, and once more four specimens were found—two by Eldon (a deformed male and a very young nymph) and two by myself (a mature male and a mature female). The deformed specimen had the tips of its callipers bent at an angle and turned inwards (fig. 1), and had

no wing-tips visible, while the wings themselves were either deformed or damaged.\* *L. riparia* feeds readily after dark on raw beef, but in the daytime each one remains still in the darkest corner of the box. This clearly points to its being a nocturnal insect.

On August 31st we again found four specimens—a fine female, a small nymph, and two males. One male had the left branch of the callipers considerably shorter than the right one (fig. 2). It was killed on September 1st and mounted.



( $\times 5$ )

These insects are often noticed cleaning themselves assiduously, and they sometimes rub their body with their legs as if they were trying to allay irritation. If a little water is put in their box they go to it, and appear to drink it greedily. In the evening they will stand on "tip-toe" as it were, quite still for a long time in the bright light under a table-lamp, whereas in the daytime they like to hide away out of the light as much as possible. On leaving the New Forest early in September two males (caught August 26th and 31st) and a nymph (caught August 26th) were taken alive to Kingston-on-Thames. The nymph died on January 3rd, 1913, but the two males are alive at the time of writing.† Though they drink readily, they seldom now seem to wish to eat. It seems likely that, as Bournemouth extends, these earwigs may become extinct in that district in the near future, and at present we know of no other British locality.

At Eastnor, in Herefordshire, a specimen of *Labia minor* was taken on May 20th, as it settled (O. Whittaker); and Mr. J. R. le B. Tomlin had a male given to him, which was taken at Stoke Edith, in Herefordshire, in September. In the middle of May

\* The male taken on August 20th had but one visible wing-tip.

† The male (caught August 31st) died about January 6th, 1913.



Colonel J. W. Yerbury sent me several common earwigs (*Forficula auricularia*)—a female found walking about on the sand at the sand-dunes near Studland, Dorset; and two males and five females from South Haven Point, Dorset, where they were apparently common under fallen soil and roots of heather on the seashore: the males had rather long, slender callipers. Mr. S. E. Brock reports *F. auricularia* as universal in Linlithgowshire. C. Adams sent me from Parkstone, Dorset, early in September, two nymphs of *F. auricularia* and a var. *forcipata* of the same species. Mr. Whittaker reports *F. auricularia* from Coventry, in Warwickshire, as was of course to be expected.

**Blattodea.**—A specimen of *Ectobius lapponicus* was taken at Penslake, Surrey, on June 15th by Mr. F. M. Carr, on the occasion of the South London Society's excursion. I received a female from Mr. G. T. Lyle, who said it was common at sugar, in Holland's Wood in the New Forest, on July 6th. On July 12th he sent me a male imago, swept from rushes in a damp spot on a heath. There were also two tiny nymphs, which perhaps belonged to the same species. On August 1st an extremely dark *Ectobius panzeri*, var. *nigripes*, was taken at Hinchleslea Bog, in the New Forest. *Blatta orientalis* was one of a few Orthoptera which Mr. O. Whittaker was able to report from Coventry.

**Gryllodea.**—Mr. C. W. Bracken tells me that a full-grown male example of *Gryllotalpa gryllotalpa* was taken alive on the sandhills at St. Enodoc near St. Minver, North Cornwall, during the week ending December 20th last. This capture is particularly interesting, as it goes to prove that the Mole Cricket hibernates in the perfect form. Both imagines and small nymphs of the Wood Cricket, *Nemobius sylvestris*, were found at Hurst Hill, in the New Forest, on September 8th. This cricket, also, is sometimes found in the winter as an imago.

**Locustodea.**—On July 9th Colonel J. W. Yerbury found *Conocephalus dorsalis* very immature at Walton-on-the-Naze: they were associated with *Carex* on the land side of the sea-wall. On August 28th Mr. G. T. Lyle found the Great Green Grasshopper, *Phasgonura viridissima*, plentiful and noisy by the side of the Avon at Christchurch, Hants; on September 21st he met with it in bramble bushes at Wyke Regis near Weymouth, and the next day at Osmington Mills on furze bushes at the top of the cliff. Writing on September 10th Mr. G. T. Porritt sent me a living specimen of *Platypleura roeselii*, which he took at Trusthorpe on the Lincolnshire coast (Wallis Kew's old locality). During the previous fortnight he took a fair number of *P. roeselii* there, notwithstanding the atrocious entomological weather, and would probably have got considerably more had the weather been anything like favourable. All his specimens, without exception, had the semi-circular border round the side flaps of the pronotum

of a bright grass-green colour, whereas the published descriptions of the insect give the colour as yellowish or yellowish-white. Mr. Porritt considers that this opinion was obtained from dried specimens, as he finds the green colour soon disappears after the death of the insect, and, in fact, from some of the earliest caught specimens, then on his setting-boards, the green had already quite faded away. In other respects, also, the colour is slightly different from that in published descriptions. Two specimens were captured on the morning of September 9th, when a strong wintry gale was blowing, one of them being that sent alive to me. The insects occurred amongst very long grasses on the sandhills. Writing later in the same month Mr. F. W. Campion told me that he and Mr. A. Luvoni took the species at two or three places on the coast of Essex and Kent, one of them being Herne Bay, where it has been taken previously. Mr. Campion says that the specimen he described in the 'Entomologist' (vol. xlv. p. 117) certainly had bright yellow borders to the flaps of the pronotum, so that they are not always bright green as Mr. Porritt found them.

**Acridiodea.**—*Gomphocerus maculatus* was found mature in the New Forest on June 29th. It was taken at Mynydd, in Carnarvonshire, a hill 700 ft. above sea-level, by Mr. E. A. C. Stowell, on August 8th–10th. Mr. S. E. Brock found this species in mid-August very abundant in many spots amongst short heather and bare ground at Kirkeowan, in the south of Wigtonshire. In Linlithgowshire Mr. Brock tells me that he has taken *G. maculatus* at Craigton (alt. about 250 ft.) on a railway bank and waste ground adjoining in great numbers on August 8th. He found it "in song" on June 23rd, 1912, in Linlithgowshire. *G. maculatus* has an almost endless range of colour variation; some are richly spotted with cream, green, red, dark-brown, &c.; some are nearly black; others, when the elytra are closed, have a conspicuous pale stripe right down the back.

*Omocestus viridulus* was met with on August 8th–10th on Mynydd Hill, in Carnarvonshire (E. A. C. Stowell); in mid-August at Kirkeowan, where it was abundant and widespread, especially along grassy roadsides, and also on the moors (S. E. Brock); Linlithgow and Bathgate Hills, abundant and widely spread all over the district (up to 800 ft.) along roadsides, pasture-land, &c.; the earliest date of the insect "in song" in 1912 was June 23rd (Brock). Mr. Brock has noticed its disappearance within the last few years from one or two spots in the highly cultivated country near Kirkliston, in Linlithgowshire. Mr. Whittaker reports *O. viridulus* from Coventry. *Stauroloderus bicolor* was found on August 8th–10th on Mynydd Hill (Stowell); in Cornwall at Sheirock, Port Wrickle, and Whitesand Bay Hotel, at the beginning of September (Yerbury);

on the railway bank near Kirkecowan Station (Linlithgowshire), where it was very numerous in company with *O. viridulus* (Brock). This last locality is about eight miles from the sea, which is possibly of interest, considering that *S. bicolor* appears to be almost, if not quite, confined to the immediate neighbourhood of the shore in the Edinburgh district and Lothians generally (Brock). *Chorthippus elegans* was taken on July 5th and 6th in a salt marsh at Walton-on-the-Naze, and again at Walton-on-the-Naze on July 21st (Yerbury); it was abundant along the coast of Lincolnshire at Sutton-on-Sea, Trusthorpe, Mablethorpe, &c. (Porritt). *Chorthippus parallelus*. — This species, like its congener, *C. elegans*, appears to be a lover of damp ground. It was taken on August 8th–10th on Mynydd Hill (Stowell); and in Cornwall at Lelant on August 24th, and at Sheirock on September 4th (Yerbury). *Mecostethus grossus* was taken in the New Forest at Silverstream Bog: the first female, a fine large one, was captured on August 1st, and the first male on August 7th; four small ones, three males and a female, were taken at the end of the month. Mr. G. Lamb took a specimen of *Tetrix subulatus* near Milton, Hants, on September 9th; and Colonel Yerbury took the common species, *T. bipunctatus*, at Sheirock, in Cornwall, on the 4th and 10th of the same month.

Kingston-on-Thames: January, 1913.

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## FIELD NOTES ON BRITISH SAWFLIES.

BY CLAUDE MORLEY, F.Z.S., F.E.S., M.Soc.Ent.France.

(Concluded from vol. xliii. p. 285.)

THE Tenthredinides is the last tribe of the sawflies in the modern grouping; it is mainly remarkable for the large size and conspicuous coloration of its members, and the ubiquity displayed by many of them during the early summer, more especially upon the margin of woods, where they may constantly be seen flitting about in the sun and resting upon the leaves of brambles, &c., apparently always at about three to four feet from the ground. The first genus, *Sciopteryx*, is extremely rare, and I have never seen either of its species; indeed, of one only a single indigenous specimen is known—that recorded by Rev. E. N. Bloomfield from Guestling, where it was captured as early as April 3rd (E.M.M. 1895, p. 24; not p. 22, as misprinted in the Nat. Hist. of Hastings, 3rd Suppl. 1898); it is now in Mr. Morice's collection. The five species of *Rhago-gaster*, on the other hand, are all of frequent occurrence, though the third and the last occur in most numbers. Chitty and I



have found *R. pictus* (Morice forget to "masculate" the species of this genus) sparingly in the marshes of the Little Ouse at Brandon; it has occurred to me at the Haven Street Woods in the Isle of Wight, and Miss Chawner takes it in the New Forest, always in June, I believe. *R. punctulatus* occurs with the following in woods, and is very liable to be mixed with it, though distinctly rarer; I have it from Norfolk, Suffolk, and the Isle of Wight. *R. viridis*, a beautiful and very pugnacious species (with which bottle no other insect!), is abundant everywhere from May to September; Banchory in the Highlands (Elliott), Ardross in Co. Ross (Gorham), Tuddenham Fen (Chitty), Suffolk, New Forest, Isle of Wight, &c. It is especially common on the flowers of *Heracleum sphondylium*. *R. fulvipes* is confined to May, in my experience; it occurs throughout Suffolk, and is usually taken on bramble-leaves. *R. aucupariæ* is even earlier in its appearance, about April 28th; it is commoner than the last, and only extends to early June. Usually taken by sweeping damp hedge-bottoms; Burwell Fen in Cambs, and Skegness in Lincs (Elliott), common all over Suffolk. Our single species of *Perineura* must be widely distributed, if the female in Capron's collection was from his usual locality, Shere in Surrey, for males are recorded from Cadder in Lanark, but these are the only known indigenous specimens; it is said to occur in May, probably among ferns (besides E. M. M. 1910, p. 236, cf. l. c. 1911, p. 103). *Pachyprotasis rapæ* is one of the commonest British insects in June, continuing to appear sparingly through July and August, even to September in Scotland. All my specimens are from woods, usually by sweeping; Felden in Herts (Piffard), New Forest (Miss Chawner), Banchory (Elliott); abundant in Lincolnshire and Suffolk. *P. antennata* has extremely rarely occurred to me, but is, I believe, common enough about Lyndhurst; Halbert took it at Belclare, on the Mayo coast, in July, 1910, and I once found it at Helpston Heath, near Peterborough, in June.

The deep red and black, often with conspicuous white markings, render *Macrophya* a striking genus, while the rarity of most of its species adds to its interest. Morice says all our species are "mostly fairly common, at least in the southern counties," but I have not found them so. Excepting the two doubtfully British *M. albipuncta* and *M. diversipes*, I have, nevertheless, obtained all our species but *M. rufipes*, known from Swanage, Worthing, Eppingham, and the New Forest. My *M. punctumalbum* were taken at the last locality by Miss Chawner; it is said to frequent privet during May and June. *M. duodecimpunctata* seems much commoner in the fens and broads of the eastern counties than elsewhere; Morice has taken it "occasionally," and suggests an attachment to alder, which is probably correct, for in East Anglian marshes, where that tree abounds,



it is to be met with abundantly, often in such numbers as to become a pest in the sweep-net among reeds and osiers. It is confined here to June 5th–20th, and a diligent search at its headquarters on May 22nd and July 4th revealed none; Wicken Fen in Cambs, Surlingham and Rockland Broads in Norfolk, very rare at Brockenhurst, but always to be found in North-west Suffolk at Barton Mills, Brandon, and Tuddenham Fen. *M. rustica* is more widely distributed, though rarer in the eastern counties. I have only a couple of specimens, taken at Woolpit, in Suffolk, by Rasor in July, 1904, and sent by Rev. E. N. Bloomfield, probably from the Hastings district. *M. blanda* is very rare here; I swept a single female from oak in a lane at Wherstead, near Ipswich, on June 16th, 1904. *M. annulata* (*neglecta*, Cam.), on the contrary, is common in Suffolk at Timworth (Col. Nurse), Needham Market (Platten), Bentley, Barton Mills, Bramford, and Moulton; I have also seen it in the New Forest and Isle of Wight. Both *M. albicincta* and *M. ribis* seem rare; the former has been swept in marshes at Brandon and Rockland Broad in early June, the latter at Burwell Fen, and once—only once in twelve years' collecting there—at Belstead, in Suffolk, at the end of May, 1904. Why so few *Allantus* species have turned up, I do not know, unless they be rare; at least one, *A. rossii*, seems doubtfully British, and I have never seen half the remaining nine. *A. scrophulariæ* is a remarkably handsome, vespiform species, always to be met with along with *Vespa germanica* at *Scrophularia nodosa* throughout Suffolk. Sich has given it me from Malvern in Worcester; it is not an early species, but is on the wing from the middle of June to that of August. Of *A. marginellus* and *A. amœnus*, I possess single examples only, presumably captured about Ipswich in 1894, but if such were the case, it is strange they never put in a second appearance. *A. arcuatus* can be accused of no such retiring habits, for it is ubiquitous from June 5th to September upon all sorts of umbelliferous flowers, from which I have frequently seen it chase flies, though I was never so fortunate as to witness a capture; but Elliott has given me a female, which he took at Banchory in the Highlands, in the act of masticating a female *Empis pennipes*, Linn., proving its carnivorous propensities. I have it from Clare Island, Co. Mayo; Glengariff (Andrews), Skene and Ballater (Elliott), Isle of Wight, Hants, Wilts, Lincs, Suffolk, and Northants.

Next we come to the typical and handsome genus *Tenthredo*, all of which have terrible jaws, and must on no account be boxed with other insects. Only *T. mandibularis* of the thirteen indigenous species is unknown to me. *T. maculata* is one of our largest and most striking sawflies, and is beaten from bushes in the middle of sparse woods in the middle of June; I took it this year flying slowly along in the Willingham Woods, near Louth, in Lincoln-

shire (whence *T. fagi* is recorded in E. M. M. 1912, p. 159). It is always rare and of single occurrence in the Bentley Woods, near Ipswich, and Wilverly Inclosure, near Brockenhurst. *T. temula* is a very common species in Isle of Wight, New Forest, Northants, Lincs, and Suffolk, not infrequently flitting about the undergrowth of the garden plantations at Monk Soham; it seems nearly confined to the middle of June. *T. mesomela* is hardly rarer, and is almost invariably taken on umbelliferous flower-heads; I have noted it in the counties given under the last species, and Dr. Cassal has found it at Ashby, near Doncaster. Its active span extends to July 20th, when males occurred to me on *Heracleum sphondylium* on the Southwold cliffs in 1901. Of *T. olivacea*, I possess only a pair, taken by Chitty at Loch Awe during May, 1893. *T. atra*, with its var. *dispar*, is not a very common kind in my experience, and is as often found in August as June, oftener in marshes than in woods; Rockland Broad and Eaton in Norfolk, Bentley and Foxhall in Suffolk, Market Rasen in Lincs, Brockenhurst, and Carramore Lake at Louisburgh in Mayo; and, with it, I once swept *T. moniliata* in the Rockland marshes. *T. livida* occurs everywhere, and both sexes vary a good deal in the extent of their rufescent coloration. It is abroad at the end of May, and extends at Monk Soham to Aug. 26th; Totham in Essex (Prof. Image), Bristol (Charbonnier), Byfleet (Sich), Hereford (Gorham), Sutton in Surrey (Campbell-Taylor), Stradbally in June, 1907 (Andrews), Cannock Chase in June, 1904 (Tomlin), the New Forest, and Northants. My solitary *T. fagi* is a female, from the Bentley Woods, near Ipswich, on June 15th, 1895; my solitary *T. velox* was beaten from hazel at the same place on Aug. 16th, 1904; and a couple of *T. colon* were taken at Matlock early in July, 1900, and at Cannock Chase on June 8th, 1904, by Tomlin. *T. ferruginea* is by no means common; Baylis and I took a pair about Ipswich in 1894; Bradley has given me a female he took at Sutton, near Birmingham, in June, 1899; and Rev. W. F. Johnson captured another at Achill Sound, on the coast of Mayo, in June, 1911, along with a female *T. balteata*, which species I have only met with in the Wilverly Inclosure of the New Forest, where it would not appear to be rare.

*Tenthredopsis* is treated of at the end of the present group on account of the difficulty attached to the determination of its species, between which there frequently exists a somewhat intangible distinction. The typical form of *T. litterata* is not very common in June; Wainwright has taken it in Wyre Forest, and I have noted it at Betchworth in Surrey, Wilverly and Matley Bog in the New Forest, Brandon in Suffolk, Mablethorpe and Market Rasen in Lincs. All its varieties are rarer, and I have only seen var. *cordata* from Ipswich on June 3rd, 1901, and Point of Aire, in Flintshire, on June 17th, 1904 (Tomlin); var.

*femoralis*, from Bentley Woods and Cavendish in Suffolk, during early June; and var. *microcephala*, found near Ipswich by Baylis, and recorded by me from Barham (E. M. M. 1897, p. 267). The handsome *T. coqueberti*, with its strong red and white markings, is abundant, and I have a long series from Chatham (de la Garde), Brandon (Elliott), Tostock (Tuck), Stradbally (Andrews), Hereford and Malvern (Gorham), the New Forest, Suffolk, Cambs, and Lincs. *T. excisa* seems rarer, and, besides Louth in Lincs, I have it only from Tostock, Lavenham, Mildenhall, Bentley, and Monk Soham in Suffolk. *T. gynandromorpha* I have not seen, but *T. dorsalis*, Lep., is by no means rarely swept in my paddock here, in the Isle of Wight, New Forest, Wicken Fen, and Andrews has sent it me from Milford Haven, usually in woods; though *T. tiliae*, Linn., prefers marshes in the New Forest, Earham near Norwich, in Lincs and Suffolk, usually on sallow; and Musham found it at Lincoln. *T. campestris*, Linn., also occurs in my paddock, Matley Bog, and Wicken Fen; Elliott has swept it at Tuddenham, and Tuck about Bungay in July. Adams has given me a single *T. tristis*, taken in his Lyndhurst garden in the middle of June, 1907; Tuck found a female *T. dorsivittata*, Cam., at Tostock eight years earlier; and I captured what Mr. Morice queries as a female *T. pavidata* on a willow-leaf in the garden here at the end of June, 1908. Three males of *T. fenestrata* turned up in the Lincolnshire Market Rasen woods in June, 1912, together with a female of *T. spreata*, the males of which (or *T. thornleyi*) have been found in Matley Bog and my paddock.

Comparatively few of our three hundred and sixty species are rare, as will be seen by the above account of one who has paid them no especial attention, but at the same time has hardly ever rejected the opportunity of bottling those that have come to his net. The group is a small one with us; Rev. F. D. Morice's admirable 'Help-Notes' have rendered the discrimination of our species a comparatively simple matter; their life-histories are no less interesting than those of the Lepidoptera, are more fascinating because so very much less worked; and the handsome appearance, with facility of capture, which they display, should recommend to everyone the study of our British Tenthredinidæ.

Monk Soham House, Suffolk: Nov. 20th, 1912.

## FRIENDS AND FOES OF THE CONIFERÆ.

By J. W. H. HARRISON, B.Sc.

THIS paper is written chiefly for the purpose of drawing attention to a factor in Economic Entomology, which, in spite of its vital importance, seems to have been neglected; this is the value of the various Arachnids and Phalangids in holding in



check enemies too small, or too well protected, to be dealt with by ordinary methods.

Four woods, situated in various parts of the country, have formed the field of my observations. The first of these is a mixed pine and larch wood, although it contains a little alder and birch. The second, in its lower levels, contains larch and alder in approximately equal quantities, but higher up, the alder is replaced by Scotch fir and spruce. The other two are purely coniferous, and contain only spruce, larch, and Scotch fir. The trees in the first wood seem never to have had a reasonable chance of flourishing, for, at the very first, the larches were planted too closely together; and, instead of being strong healthy trees, becoming stronger with each thinning out, they have become sickly, and simply invite the hordes of insect pests they have succeeded in attracting. When I first commenced my work in this wood seven years ago, both pines and larches were attacked by sawflies; the larch by the Larch Sawfly (*Nematus* (*Lygæonematus*) *erichsonii*), and the pines by the Pine Sawfly (*Lophyrus pini*); but both of these at the present time, although not exterminated, are negligible quantities, for the attacks of the ichneumon *Mesoleius aulicus*, and, more particularly, the ravages of a white fungus in the soil, have destroyed them in myriads. Helping these agents too, during the winter, are the various ground beetles, belonging to the Carabidæ, and also field voles. Unfortunately, these enemies are no "respecters of persons," and they attack and destroy parasitised cocoons as well as those containing sound larvæ; and it is, therefore, just possible that, when the parasitic ichneumons are becoming powerful enough to cope with the pest, they do more harm than good. It would, therefore, be better to beat the larches when the larvæ of *Nematus erichsonii* are about to descend, and to allow the larvæ thus obtained to pupate under artificial conditions. As the sawflies and any super-parasites emerged they could be destroyed, whilst the ichneumons could be liberated in the woods to continue their good work.

The sawflies were aided in the work of destruction by shoals of lepidopterous larvæ, chief amongst which were those of *Coleophora laricella*, *Phigalia pedaria*, *Gonodontis bidentata*, *Hybernina marginaria*, and *Oporabia autumnata*. All of these, with the exception of *H. marginaria*, were of sufficient importance to need special attention, but a succession of wet seasons has thinned out all except *C. laricella* and *P. pedaria*, both of which, especially *C. laricella*, do untold damage, and therefore demand treatment. Just after the young needles are put forth the hybernated larvæ of *C. laricella* burrow into them and injure them to such an extent that I have seen thousands of trees early in June looking as if blighted by frost. The pines, too, suffered from the attacks of *Panolis piniperda*, the larvæ of which could be beaten out in hundreds. It, too, is gone.



In this wood, as well as in the second, the trees bear crowds of *Lachnus pinicola*, which, however, are kept under control by Ladybirds, chief of which are *Coccinella ocellata*, *Mysia oblongoguttata*, *Adalia oblitterata*, and a strong sturdy form of the Seven-spot Ladybird (*Coccinella septempunctata*). This form is larger, and is of a deeper red than the type, and, as I have only seen it in pine woods, I call it var. *pini*. The larvæ of these beetles can be observed in great quantities in some seasons. In spite of the good work done by all these friends, the larches in both woods are being killed off slowly but surely; in the first, *Coleophora laricella* is the culprit, and in the second, the Woolly Larch Louse (*Chermes laricis*). These are not only destructive in themselves, but both so weaken the trees that they cannot resist the attacks of the Larch Fungus (*Peziza willkommii*), the spores of which find an entrance at the injured points. In the end, *Sirex noctilio* singles out the affected trees, and the presence of the huge grub of this insect soon causes their final collapse. I do not think that either *Sirex gigas* or *S. noctilio* ever attacks sound trees, for I have twice seen *S. noctilio* ovipositing, and in each case the tree was in a dying condition. Lastly, all the trees containing *Sirex* larvæ had, when I examined them, been in a poor state for a long time, and consequently bore no low branches.

It seems to me an extraordinary thing that such destructive insects as *Coleophora laricella*, *Chermes laricis*, and *C. abietis* are ever allowed to get into our coniferous woods, for they are not native insects. If all nursery stocks of both spruce and larch were sprayed in April and May, either with petroleum and flour emulsion, or lime sulphur wash\* or with any arsenic spray, it would be impossible for these pests to reach new plantations. If preferred, the spraying could be done for two consecutive Springs on the young transplanted larches when the hybernated *Coleophora* larvæ are renewing their cases, and the supply of needles, both for that purpose and for food, is limited. At the same time *Chermes laricis* and its form *C. abietis* are in their most defenceless condition. After the trees are once established the cost of spraying would be prohibitive.

I could not help contrasting the poor state of these larches with the stately larches and spruces in the other two woods. It was not that the various enemies enumerated above were absent, for I could see signs of practically all. It was because they were all under the control of their natural enemies. What, then, are the natural enemies of *Coleophora laricella*, *Chermes laricis*, and its form on the spruce, the Spruce Gall Louse (*Chermes abietis*)? By beating larch, spruce, and juniper, a simple answer was

\* This wash if not carefully used would injure the young foliage. Recent experiments, however, on peach trees, have shown that even their delicate blossoms escape unharmed when the spray is in competent hands.

obtained. The branches swarm with spiders, amongst which a "rare" species, *Bolyphantes expunctus*, predominates. Although considered very rare, in these woods it occurs in millions. It is far from being a typical *Bolyphantes*, for instead of being a ground spider like its congeners *Bolyphantes alticeps* and *B. luteolus*, it lives on the twigs of conifers. Spinning no snare, it spends its life devouring Aphids, although in all probability it will not reject other insects if obtainable. Chief amongst the Aphids beaten with it were *Chermes abietis*, *C. laricis*, and *Lachnus piceæ*; the first two in the winged state, and the last as larvæ. The adult and subadult conditions of *B. expunctus* coincide with the assumption of the winged state by *Chermes*. It seems then that, if colonies of this spider were transferred from woods in which it was abundant to woods infested with *Chermes*, an enormous quantity of spruce and larch could be saved. I can confidently state that, in spite of the fewness of its recorded localities, this spider occurs in multitudes in most mixed spruce, larch, and juniper woods in the North of Scotland. In a little over an hour I have beaten enough specimens to supply all the arachnologists in the world several times over.

Struck by the above observations first made in 1908, I have paid special attention to the study of pine wood spiders and their economic value. In the case of those possessing snares, I have examined the contents thereof to see what they preyed on. I was surprised when I examined the woods, in which the trees were in the worst condition, to note that, except for the Microtheridiids, the spider fauna was a scanty one. A few odd *Meta segmentata*, *Zilla 10-notata*, *Drapetisca socialis*, and *Amaurobius fenestralis*, composed the "take," but all of the webmakers of these were evidently of great use. The floccose snares of *A. fenestralis* were full of the wings of aphids, sawflies, and last, but not least, of the elytra of the Pine Weevil (*Hyllobius abietis*), and of the various pine-feeding Scolytids. These useful Arachnids did not compensate for the almost total absence of the larger ground spiders belonging to the Drassidæ and Lycosidæ and the Epeirids. The cause of this absence was plain. When these plantations were made they were formed on an open moor, which was first fired to clear it of gorse and heather, and then surrounded by a stone wall. In this way all the larger spiders were cleared out, and their reintroduction effectually prevented. The "micros," able to colonise new ground by using their floating strands to carry them, got back again. It was possible, too, for winged insect pests to appear, and, together with those brought in with the trees, to increase and multiply without check until the advent of their enemies in the form of ichneumons, &c. Unfortunately, *Coleophora laricella* is but little affected by these insects, although one would have expected it to be the first attacked, for its near relative, *C. cæspititiella*, feeding on the

rushes on the moors near by, is badly infested. *Chermes*, too, escapes to a great extent, for neither Syrphid nor Coccinellid larvæ can get at it in its most destructive stages, and it can, therefore, do enormous damage. It is easy to see that, if one could introduce enemies of these creatures in the form of spiders which would attack them in their most vulnerable stages, and at a time when their destruction would be of most use, they would soon be held in check. It has already been indicated in what way *Bolyphantes expunctus* could be enlisted; but, unfortunately, it only becomes adult in August and September, and its use is limited to attacking *Chermes*. Possibly, as in the case of *Bolyphantes luteolus* and *B. alticeps*, a few adults hibernate and continue the work on *Chermes* in spring, but this does not provide for the summer months. For effective work during summer, therefore, it would be necessary to look out for spiders adult or subadult then. These spiders would have to satisfy the following conditions:—

(1) They must be easily obtained. (2) They must be active and adult when *Coleophora laricella* is in the adult state. (3) Otherwise they should form an unbroken sequence to cope with other pests during the season. (4) They should be of arboreal habits.

(To be continued.)

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## A MONTH'S COLLECTING IN HUNGARY.

BY GERARD H. GURNEY, F.E.S.

ON Monday, May 13th, I left Ostend in the Orient Express for Budapest for a month's collecting in Hungary. Previous collectors who have visited Hungary have generally done so well and found so many rare and interesting species there that I felt, at any rate, I might reasonably hope for a certain amount of success. It was therefore with great anticipations of good things to come that I sped across Europe, my first entomological observations beginning at the German frontier city of Passau, where the train stopped for nearly an hour, and I saw several apparently fresh specimens of *Papilio podalirius* sailing round some flowering shrubs which grew on either side of the Place in front of the cathedral. From Passau to Vienna the train runs through somewhat uninteresting country, but after leaving the latter city the surroundings become much more varied, with vine-clad slopes running up to the lower spurs of the Little Carpathians, and picturesque valleys which looked as though they might prove to be good collecting ground.

As an entomological centre Budapest is not at all a convenient spot, and it is only because several rare and local



species are found in the vicinity, and that accommodation is impossible nearer to their localities, that one has perforce to stop there. It means quite a journey by tram or train to get anywhere at all, as the town is so large it takes a very long time to get beyond the endless suburbs and ramifications of streets and houses; moreover, this makes discovering fresh ground difficult, and one is apt to go again and again to the two well-known localities—i. e. the Schwabenburg and the Budafok marshes, excellent though they both are, instead of seeking fresh ground and perhaps turning up fresh species. I saw from a distance several places I should much liked to have worked, which looked as though they might produce very good results, if one had the time and means to get there.

I had arranged to stay at the Hungaria, but I changed to the Hotel Bristol, which I found to be equally good, much quieter, and, most important of all, cheaper.

My first day at Budapest, May 15th, was devoted chiefly to settling about the hotel and seeing various officials with regard to an expedition to Pészer, which can now only be visited with special permission, but on the 16th I was early on my way to the celebrated Schwabenburg, and after ten minutes in a steamer, twenty minutes in a tram, and forty minutes in a train, I arrived at the station of Schwabenburg itself, and then had only a short walk before I got to the wooded part of the hill which was the objective of my journey. This hill, which is called in Hungarian Sváb-Hegy, has been so often described by previous writers that it is quite unnecessary for me to further dilate on it; at the top are still large patches of untouched wood, with many open glades and spaces, and here I soon found butterflies to be common, though owing to the day being somewhat dull, with a good deal of wind and not much sun, they were not flying very freely. In the warmest and most sheltered spots the two "skippers," *Hesperia malva* and *Pyrquus orbifer* were both quite common and in beautifully fresh condition; the two species were generally flying in the same places, though perhaps *orbifer* was rather more local than the other; at first they are somewhat difficult to distinguish apart on the wing, though one soon sees that *malva* is distinctly smaller and darker. *Orbifer* when quite fresh has a beautiful plum-coloured flush on the wings which, however, very quickly wears off; they appeared to be a very pugnacious species, constantly chasing other passing insects, to return again, after driving the intruder away, to the same spot. Flying briskly over the flowery spaces were many fresh *Colias hyale*, but the two commonest species on the wing were *Papilio podalirius* and *Euchloë cardamines*, the latter being extremely abundant, with fine large females. In one or two places *Thais polyxena* was fairly frequent and still in quite good order, and here also newly emerged *Melitea phæbe* were not uncommon, and a single



*Issoria lathonia*. Near the top of the hill one fresh specimen of *Parnassius mnemosyne* was taken, and *Cyaniris argiolus*, *Pieris rapæ*, *Leptosia sinapis*, *Gonepteryx rhamni*, *Cænonympha pamphilus* were all of frequent occurrence, while a single specimen of *Polyommatus orion* var. *ornata* appeared to be the first fore-runner of its generation.

The following day was cool and inclined to rain, and I spent a long time trying to find the well-known locality near Budafok for the two "coppers," *Chrysophanus dispar* var. *rutilus* and *C. thersamon*, but went a good deal too far beyond the village and missed it, only having a very long walk through most unpromising-looking country, seeing practically nothing until late in the afternoon, when, coming back along the banks of the Danube, I picked up out of a little swampy dell a fresh male *C. thersamon*, two or three *Melitæa cinxia*, and a single specimen of *Rusticus argus* (*ægon*). The next day was wet, and it was not until the 19th that I was really collecting on the marshy ground which stretches from Budafok as far as and beyond the station of Kamaerardo; on these marshes and in the adjoining wood I spent many delightful days, nearly always finding something fresh in this splendid locality, though perhaps butterflies were not generally as plentiful as I had expected. During the eight days I spent at Budapest the weather was anything but propitious—only two days were really fine and hot, the others being wet; moreover, several brilliantly fine days were completely spoilt from an entomological point of view by the tremendously high wind, which made all collecting out of the question.

However, the 19th was one of the perfect days, and I made the most of it, and seldom have I enjoyed a day more; the valley in which I was collecting was still covered with uncut hay, amongst which flowering-plants of all descriptions grew in profusion; the willow trees on either side of the little stream which runs the whole length of the valley were covered with emerald leaves, and among them great numbers of very tame golden orioles piped their flute-like notes. Further on, where there is a small swamp, great patches of yellow iris in full flower added brilliant touches of colour. Flying amongst the uncut hay were plenty of newly emerged *Cænonympha iphis*, with well-marked under sides; fresh *M. phæbe* were also common, with occasional *Brenthis dia*. Sitting on the thyme flowers were fine large *Polyommatus icarus* males and several *R. argus* (*ægon*). Further along *Nomiades cyllarus* was not uncommon, fine large specimens, though not such giants as those I was to take in a fortnight's time at Herkulesbad! Here also were odd examples of *C. phlæas*, several newly emerged *Agriades thetis* males, and a few *Pyrameis cardui*, while *C. hyale* was everywhere abundant and quite fresh. At the corner where the wood joins the meadows I found *T. polyxena* plentiful, but they were mostly

much worn, and there were only very few which could be considered worthy of cabinet rank; here also I took a few fresh *M. cinria*, smaller and darker than my specimens from the Riviera or Digne, while *E. cardamines* and *Nisoniades tages* were both common. On the way home two *Erynnis alcea* were taken off the path near the farmhouse, and a few minutes afterwards, when I had almost despaired of seeing it, I captured two *C. thersamon*, both males in perfect condition. The following day, on the same marshes, I found *C. thersamon* common, but local, and was able to take a nice series of this lovely "copper." They were very fond of sitting on the white composite flowers of a plant which grew somewhat abundantly by the side of the path, and this was a very convenient habit, as it prevented the necessity of going into the standing hay after them; when sitting with expanded wings to get all the heat from the rays of the afternoon sun they are a beautiful object, and one is easily able to pick out the good specimens and leave the others; the females were scarce and I did not get more than three or four. Several other species were taken which I had not noticed the previous day; *R. argus* (*ægon*) was becoming plentiful, and several fresh *Loweia dorilis* males were netted. In Promontor Wood a very fine dark form of *Pararge mæra* was frequent; this variety was so much like a large *P. hiera* that I at first mistook it for that species. *P. podalirius* and *P. machaon* were both rather common, and single specimens of newly emerged *Aporia crategi*; two very fine large male *P. baton*, and a few *Pontia daplidice* occurred; while a pair of fresh *Melitæa trivia* were secured at the wood. Of the latter species I had hoped to have secured a series on the Schwabenburg, but never saw more than one or two specimens on any of the three days I visited that locality.

The best place near Budapest for *M. trivia* is Csepel, which is a large island in the Danube, a short distance south of the city, which I visited on the afternoon of the 24th, as I was anxious to secure a series of this species. After walking through the village towards the south end of the island for a couple of miles, one comes to a large stretch of virgin forest, which covers the whole of this end of the island; it is mostly composed of small oaks, dwarf poplars, and thick juniper scrub planted on numerous sandhills, the open spaces and glades between them being covered with rushes, coarse grass, and flowering-plants growing very luxuriantly. The soil is very sandy, in fact the conditions here are almost exactly the same as in the forest at Pészer; and probably both localities are untouched remains of the vast primeval forest which in bygone ages stretched for miles over this part of South-eastern Europe. Like Pészer, also, this end of Csepel Island is an extremely prolific locality for butterflies, and I found several species very abundant.

(To be continued.)

## NOTES AND OBSERVATIONS.

**DURATION IN THE LARVA STATE OF TROCHILIUM APIFORMIS.**—In recent volumes of the 'Entomologist' there have been several notes on the earlier stages of this insect, and especially concerning the length of time it remains in the larva state. In the volume for 1911, p. 362, I recorded having seen a female on the bole of a balsam poplar in my garden engaged in ovipositing, dropping her eggs loosely on the ground at the base of the tree. A considerable number of eggs were laid, and after securing a dozen for a correspondent who wished to figure them, I left the rest, which I watched from day to day for some time. But one morning all trace of them had vanished, and I concluded that ants, earwigs, woodlice, or some other predatory beasts had devoured them. On August 2nd, 1912, however, my daughter drew my attention to a fine freshly emerged female moth at the bottom of the tree, and there was an empty pupa case protruding from its cocoon in the earth close by. It is of course possible that this particular moth resulted from an egg laid before 1911, but the tree showed no sign of any previous attack, though it had often been examined on the chance of finding this species or *Saperda carcharias* attacking it in previous years. It seems therefore probable that this moth was produced from one of the eggs which I saw being laid, and, if so, the newly hatched larva must have entered the earth and penetrated the underground portion of the stem or one of the roots. It is of course possible that other larvæ may still be feeding in the roots, though there are no signs of them on the surface; but so far as the evidence goes it seems to indicate that the larva is not always two years in arriving at maturity, as some writers have suggested. Though I have frequently found this insect on the boles of trees and at rest on leaves, I do not remember having seen it on the wing until one morning last July, when several specimens were flying about among the poplars in my small plantation. Getting only a momentary glimpse of the first, I mistook it for a hornet, less from its appearance than from the loud humming sound caused by the vibration of its wings; but there could be no mistake about the sound. A good view of a perfectly fresh specimen flying in the sunshine is a sight to be remembered.—W. H. HARWOOD; 62, Station Road, Colchester, January 4th, 1913.

**AN UNUSUAL PARSNIP PEST.**—In North Durham last year I was struck by the enormous damage that seemed to have been done to some seeding parsnip plants (*Pastinaca sativa*). The flowers and immature seeds seemed to be spun together in huge masses, through which silk-lined tunnels passed in all directions. I suspected that this was the work of a *Depressaria* larva, but for a long time I failed to find one, as it was late in August when I observed the damage. However, close search on a very large plant yielded two larvæ, which proved to be those of *Depressaria heracliana*. In many cases the plants were quite killed, and no seeds produced. As I knew that *D. heracliana* pupated in the stems of *Heracleum sphondylium*, its more usual food-plant, I examined the stems and sheathing leaves for pupæ, but not a single one could I find. I could see dozens of



places where the larva had eaten in order to penetrate the stem, but in no case had it succeeded in getting inside, and although I pulled whole plants to pieces and dug up the ground near the plants, I never found a single pupa. Where they had pupated was a mystery. It is certain that no mistake was made in the identification of the larvæ, which agreed in every detail with those taken from *Heracleum*. I see that the same species has been reported as affecting beds of seeding parsnips in nursery gardens in Canada. The advice given was to uproot the affected plants and destroy them. It would be a far better plan to destroy the plants of *Heracleum* which are bound to be near by (*Heracleum sphondylium* grows in Canada), and to hand-pick the flowers of the parsnips late in June or early in July. Any damage done previous to that could be neglected. That hand-picking is satisfactory in this case I have ample evidence, for when working at the *Depressaria* some time ago, I took all I could get from one locality, and for two or three years that spot produced none, although they are now as abundant as ever. The attacks of ichneumonons on both *Depressaria heracliana* and its close ally *Depressaria nervosa* are of no importance. Not one per cent. is parasitised. A far more important enemy is the common earwig which destroys hundreds of pupæ.—J. W. H. HARRISON; 181, Abingdon Road, Middlesbrough.

THE JEFFREY AND THE BAXTER COLLECTIONS. — The collection formed by the late Mr. W. Rickman Jeffrey, of Ashford, and which "came under the hammer" at Stevens's Rooms on December 10th last, although by no means an extensive one, had some claims to antiquity. Few lots, however, appeared to attract any great amount of interest, but among those that received some attention may be mentioned a fine male *Chrysophanus dispar* that realized seven guineas, and an equally good female that went for £6 10s.; two pairs of *Laelia canosa*, which, when put up with a former lot that had failed to find a buyer, brought 32/6; and the lot in which a specimen of *Diasemia ramburialis* was included ran up to £2 5s.

The more notable lots in Mr. T. Baxter's collection were a series of forty-one *Luperina*, described as "*nickerlii*, *gueneei*, *baxteri*, v. *iota*, v. *murrayi*, v. *minor*, v. *fusca*, all from St. Anne's, 1911, T. Baxter," for which 30/- was given; a black form of *Anthrocera filipendulæ* (var. *chrysanthemi*) reared from a larva found by Mr. Baxter at Fleetwood in 1888, which realized eleven guineas; a lot in which fourteen *Eupithecia innotata* were included which sold for 30/-; and a couple of rather well-marked varieties of *Abraxas grossulariata*, which brought 26/- and 21/- each respectively. Each of the collections contained four specimens of *Cucullia gnaphalii*, those in the former in a lot with sundry other species realized 20/-, while those in the latter by themselves brought 18/-.

In the same sale were included some sixty odd more or less remarkable varieties of *Abraxas grossulariata* reared during recent years by Mr. Harwood, of Colchester, the result in the majority of cases of selected interbreeding, among which the more important lots were, to quote the catalogue descriptions, among the *lacticolor-lutea* forms — "a combination of *radiata* and *nigro-venata* with broad



yellow band " 20 -, "*nigro-venata*, a magnificent strongly marked female," 30 -, "an exceptionally fine light female with clear yellow ground colour," 32/6, "*nigro-venata*, a large and handsome radiated female," 32 6, and "a somewhat similar specimen suffused with black scales," 22 -. Of other forms, one described as "a magnificent female of *nigro-venata* type with broad orange band," sold for 45/-, and "a wild female deeply suffused with orange-yellow," made 42/-. The majority of the other lots went for a few shillings apiece, the total realized being just under £30 for the sixty-three specimens.—R. A.

**TORTRIX PRONUBANA REARED FROM IVY.**—Some two or three years ago I reared a couple of specimens of *Tortrix pronubana* from rolled ivy leaves: but, as in the case of others that I have from time to time reared from privet, rose, and even *Chrysanthemum*, the plants on which they were found were growing in very close proximity to hedges of *Euonymus japonica*, on which larvæ were known to be feeding, and the insects were either in the pupal web or had actually turned to pupæ when found, I hesitated to regard the ivy as the food-plant, as there was a possibility that the full-fed larvæ might have been disturbed from the *Euonymus* and spun up in the other plants as the first suitable place that they came upon for pupation. In September last, however, I met with larvæ feeding in ivy leaves far from any *Euonymus*, and not only were many of them by no means full-fed, but were distributed in little patches over the ivy for nearly a mile, and every one that I took produced *T. pronubana*, excepting in the case of two or three, from which a dipterous parasite known to infest that species emerged. We may therefore, I think, now accept ivy as one of the regular food-plants of the species.—ROBERT ADKIN; Lewisham, December, 1912.

**SYMPETRUM FLAVEOLUM, L., IN NORFOLK.**—A fully mature male example of *Sympetrum flaveolum*, L., has just been submitted to me by the Hon. N. Charles Rothschild. This dragonfly was taken by Mr. J. H. Woodger, who informs me that he found it on the sandhills of Blakeney Point, North Norfolk, between July 26th and 31st of the current year. I have not heard of the capture of *S. flaveolum* elsewhere in this country during 1912, and in view of the measure of uncertainty which still exists about the status of the species as a British insect, it seems desirable to record all such occurrences.—KENNETH J. MORTON: 13, Blackford Road, Edinburgh, December 18th, 1912.

**PYRAMEIS ATALANTA.**—My experience differs from that of Mr. Postans (Entom. vol. xlv. p. 324). *P. atalanta* larvæ have been abundant here continuously, and in all stages, from the beginning of July until well into November. The last I found was full-fed Nov. 7th, and these pupated two days later. I noticed females laying eggs at the end of May and also in mid-August. Surely there can be no doubt that there are at least two broods of this insect?—C. E. NEWNHAM; Ringwood.

**PACHNOBIA RUBRICOSA IN NOVEMBER.**—On November 16th last, a moth flew to the window, attracted by my electric light. I opened

the window and the insect flew into the room and was captured. I was greatly surprised to find that it was a freshly emerged specimen of *P. rubricosa*.—PERCY RICHARDS.

PTEROPHORUS PHEODACTYLUS, Hübn., IN YORKSHIRE.—In 'The Naturalist' for January (No. 672) Mr. W. Mansbridge records *P. pheodactylus* as plentiful among *Ononis arvensis* at Sledmere on July 10th, 1902.

#### FURTHER RECORDS OF COLIAS EDUSA IN BRITAIN, 1912:—

*Essex*.—Mr. Norman Lott caught a very large female specimen on May 19th. It was flying about a market garden near Maldon. Several others were seen about the same time.—E. E. BENTALL; The Towers, Heybridge.

*Isle of Wight*.—A fine male was seen near Freshwater on May 13th. It was flying along the edge of the cliff, and passed within a few yards of me.—JOHN B. HICKS; Stoneleigh, Elmfield Road, Bromley, Kent.

*Glamorgan*.—On June 24th a specimen, in perfect condition, was taken from a flower-head of the common St. John's wort near Cardiff. No other specimen of the species was seen until Sept. 21st, when one was noted at Marshfield.—F. MORTON; 126, Queen Street, Cardiff.

*Kent*.—*C. edusa* was common here during the latter part of July.—PERCY RICHARDS; Seabrook, Hythe.

*Sussex*.—Between August 22nd and September 6th I captured ten specimens, all males, at High Down, between Littlehampton and Worthing.—W. GIFFORD NASH; Bedford.

*Midlands*.—Early in October I saw a beautiful specimen in Sutton Park, Birmingham.—ERIC BIDDLE; Selborne, Western Road, Wyde Green, Birmingham.

*Cornwall*.—During September and the first week in October I was in West Cornwall, and whilst there saw eight or nine specimens of *C. edusa*, mostly in fresh condition.—HAROLD HODGE; 9, High-bury Place, N.

EPHEMEROPTERA, PLECOPTERA, AND TRICHOPTERA FROM CENTRAL WALES.—The species enumerated in the following list were among the very few insects I obtained at Llandrindod Wells, Radnorshire, last August. For their identification I am indebted to Mr. Eaton (Ephemeroptera) and to Mr. Morton (Plecoptera and Trichoptera). I have also to thank Mr. H. Campion and Mr. Lucas for kind assistance in obtaining this authoritative determination. Three or four species of the Planipennia were also secured, and these will be referred to by Mr. Lucas in his paper on the species of the order noted in Britain during 1912:—

EPHEMEROPTERA.—*Ephemerella ignita*, Poda; *E. notata*, Eaton; *Baëtis rhodani*, Pict.; *Heptogenia sulphurea*, Müll.; *Ecdyurus venosus*, Fab. Disturbed from alder bushes growing on margin of the river Ithon at Shaky Bridge. Nearly all were of the female sex, and in subimago stage. They matured in the pill-boxes, and remained alive for several days.

PLECOPTERA.—*Chloroperla grammatica*, Poda; only one specimen captured. *Leuctra geniculata*, Steph.; several seen. *L. klapaleki*, Kempny; one specimen.

TRICHOPTERA.—*Limnophilus lunatus*, Curtis (two); *L. auricula*, Curtis (one); *L. sparsus*, Curtis (several); *Lepidostoma hirtum*, Fab. (one); *Hydropsyche lepida*, Hag. (one); *Glossosoma vernale*, Pict. (one). The majority of these insects came to electric lights in house.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting.

EARLY EMERGENCE OF *SELENIA LUNARIA*.—A year ago I recorded an early emergence of *S. lunaria*, viz. on January 15th, 1912. I have now to record a still earlier emergence of the same species. On looking at one of my pupa-cages on January 5th I found a female specimen fully developed, which may have emerged several days earlier. The cage had been kept in my dining-room. The mean temperature of the preceding weeks had, of course, been considerably over the average for the time of year.—(Rev.) J. E. TARBAT; Fareham, January 16th, 1913.

PIERIS BRASSICÆ LARVÆ IN JANUARY.—In the 'Entomologist,' vol. xli. p. 39, I recorded finding four larvæ of *P. brassicæ* on January 4th, 1908, at Rayleigh, Essex; these were fully grown, and had already begun spinning themselves up for pupation. In the same volume, p. 62, Mr. W. E. Butler states that he found several larvæ of this species in his garden at Reading on January 10th, 1884, a very mild winter. I am now able to again record the appearance of the larvæ of this butterfly in January. On the 12th ult. I received for identification four fully grown larvæ from Mr. W. F. Dale, which he found feeding on brussels sprouts in his garden at Witney, Oxon. In his letter accompanying the specimens he says: "Until recently there were quite a lot of them, and during the past few days they have been crawling up the windows of the house to spin up." One of the four larvæ received has pupated; it spun up on the 13th and pupated 18th, the transformation occupying five days, although kept in a warm room.—F. W. FROHAWK; January 19th, 1913.

NEMEOBIUS LUCINA EMERGING IN DECEMBER.—Seeing Mr. R. G. Benton's note on the above in 'The Entomologist' for January, I examined a few pupæ (eleven) of *N. lucina* which I had kept out of doors, and I found that one imago had emerged and was lying dead but in good condition on the floor of the cage.—G. BERTRAM KERSHAW; West Wickham, Kent.

EUPITHECIA (PUMILATA?) IN JANUARY.—When staying in Truro I saw, on the evening of January 2nd, a *Eupithecia*, which I believe was *pumilata*, sitting on the drawing-room wall. I had no entomological apparatus with me and so did not box it. It was a perfectly fresh specimen and I do not think I am mistaken in the species.—H. V. PLUM; Kelly College, January 23rd, 1913.

CUCULLIA CHAMOMILLÆ EMERGING IN NOVEMBER.—If Mr. W. A. Tyerman will turn to vol. xxv. of the 'Entomologist,' p. 16, he will see that I there recorded having bred a specimen of this moth on November 5th.—GERVASE F. MATHEW; Lee House, Dovercourt, January 20th, 1913.

'THE REVIEW OF APPLIED ENTOMOLOGY.'—The Committee of the Imperial Bureau of Entomology will issue from January, 1913, a



monthly journal under the title quoted. It will be edited by Mr. Guy A. K. Marshall, and will deal chiefly with insects that are known to be either noxious or useful; a summary of the current literature on the subject from all parts of the world will be given. Further particulars will be furnished by Messrs. Dulau & Co., Soho Square, W.

HEWITSON'S DRAWINGS OF LEPIDOPTERA.—KEY TO THE SPECIES.—In the Hancock Museum, Newcastle-on-Tyne, is to be found an octavo volume of plates painted by Hewitson; not to be seen, however, in the library with the other books of Hewitson, to which museum Mr. Hewitson at death bequeathed the whole of his splendid entomological library; this volume reposes carefully in the safe. It consists of 532 exquisitely painted plates by Mr. Hewitson, with the name of the species opposite each in copper-plate writing; they are magnificent miniatures of the species, not all, however, described by Mr. Hewitson. There 532 plates, averaging five illustrations to a page, with 1,881 specimens, and figuring in all about 1,537 species. They illustrate amongst others the following: Papilionidæ, Pieridæ, Danaidæ, Heliconidæ, and other families. Mr. E. Leonard Gill, the Curator of the museum, first showed me this work during 1911, and I was much struck with the beauty of the drawings and the value as an adjunct of Hewitson's other books. This book indeed appears unknown, and recently when I was over I took the above particulars of it. It is bound with a title-page and notes by Lieutenant-Colonel Adamson as below:—

"This wonderful collection of drawings of Butterflies was made by W. C. Hewitson. It contains 1,537 species, all beautifully coloured, and most of them named by him. It was bequeathed by him to the Natural History Society. April, 1899."

The title-page is as follows: "A collection of original water-colour drawings of Rhopalocera by Wm. C. Hewitson; was bequeathed by him with his Entomological library to the Natural History Society of Northumberland, Durham, and Newcastle. August 6th, 1901. C. H. E. Adamson, Lt.-Col."

I think some valuable determinations could be elucidated by a critical examination of this book.—J. HENRY WATSON.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, November 6th, 1912.*—The Rev. F. D. Morice, M.A., President, in the chair.—Dr. Emile Frey-Gessner, La Roseraie, Genève, Switzerland, was elected to the Honorary Fellowship rendered vacant by the death of Prof. Ganglbauer.—Messrs. G. C. Bodkin, Government Entomologist, George Town, British Guiana; C. Talbot Bowering, Acting Commissioner of Customs, Wenchow, China; Frederick Lionel Davis, J.P., M.R.C.S., (Eng.), L.R.C.P. (Lond.), Belize, British Honduras; Dr. John Dewitz, Devant-les-Ponts, Metz, Lorraine; Howard Mountjoy Hallett, 13, Earl Road, Penarth, Glamorgan; A. D. Imms, D.Sc., B.A., F.L.S., Forest Zoologist to the Government of India, Forest Research Institute, Dehra Dun, U.P., India; Nigel Jardine,



2. Castle Street, Ashford, Kent; Harold H. King, Government Entomologist, Gordon College, Khartoum, Sudan; Jal Phirozshah Mullan, M.A., Assistant Professor of Biology, St. Xavier's College, Chunam Kiln Road, Grant Road, Bombay, India; Edward J. Pater-son, Fairholme, Crowborough; W. Rait-Smith, 86, Gladstone Street, Abertillery, Monmouthshire; and Dr. Adalbert Seitz, 59, Bismarck-strasse, Darmstadt, Germany, were elected Fellows of the Society.—The Rev. G. Wheeler exhibited, on behalf of the Rev. F. E. Lowe, a series of *Brenthis pales* taken in the Heuthal, Bernina Pass, on June 24th, 27th and 28th, 1912. Some were of the var. *isis* and some of the females of the ab. *napæa*, but the most remarkable were very pronounced examples of the ab. *suffusa*, Wh., both male and female, some of the latter being almost completely black; also, on behalf of Mr. R. M. Prideaux, a series of unusually blue females of *Polyommatus icarus*, taken in the spring of this year in the Westerham district.—Mr. L. W. Newman, a long and constant series of *Melitæa aurinia*, bred from two batches of ova laid by North Cornwall females; the series comprised several hundred specimens and was exhibited to show the very small variation in such a large number of this variable species; also, on behalf of Mr. G. B. Oliver, a varied series of *M. aurinia*, bred by the latter, also from North Cornwall larvæ.—Mr. W. A. Lamborn, two larvæ and two bred imagines with corresponding pupa-cases of the Lycaenid butterfly *Euliphyra mirifica*, Hall. The larvæ were found in a nest of the ant *Ecophylla smarag-dina* var. *longinoda*, no less than nineteen being obtained from three.—Professor Poulton read a letter, written May 27th, 1912, from Pera-deniya, Ceylon, by Mr. E. E. Green, describing the production of the spherical structures on the cocoons of the Tineid moth *Epicephala chalybacma*, Meyr., and exhibited the cocoons referred to therein.—Mr. J. A. de Gaye, examples of the West African Agaristid moth *Messaga monteironis*, Butler, and its model the Hesperid *Pyrrhochalcia iphis*, Drury, captured by him.—Mr. H. M. Edelen, a living Buprestid larva (species uncertain) which had been found in Messrs. Allen and Hanbury's works at Ware in roots of sandalwood.—Dr. F. A. Dixey made some remarks on the Pierine genus *Pinacopteryx*, illustrating them by exhibiting male and female specimens of most of the species, side by side with which were shown drawings made to scale of the plumules characteristic of each form.—Mr. Donisthorpe exhibited a specimen of *Thorictus foreli* var. *bonnairei*, Wasm., a small beetle, fastened on to the antenna of an ant, *Myrmecocystus bicolor*, F.—Mr. A. Bacot, an Acridiine Orthopteron from the Ben-guella Plateau, which bore a very perfect resemblance to the scorched grass-stems, on one of which it was resting; also specimens of the Dipteron *Glossina palpalis* var. *wellmani*, Austen, from Catumbella River.—Mr. Eltringham, two specimens of an unusually large Lasio-campid larva which had been presented to the Hope Department by Mr. C. A. Foster, who took them in Sierra Leone. Each larva was about seven inches in length. Professor Poulton suggested that the larvæ might perhaps be *Gonometa subfascia* Walk., or *G. regia*, Auriv.—The following papers were read:—"On New Species of Fossorial Hymenoptera from South Africa, chiefly Elidinae," by Rowland E. Turner, F.E.S.; "The Life-History of *Pseudacreea curytus*

*hobleyi*, Neave," by G. H. D. Carpenter, B.A., B.M., B.Ch., F.E.S.; "Some Luminous Coleoptera from Ceylon," by E. Ernest Green, F.E.S.

Wednesday, November 20th, 1912.—The Rev. F. D. Morice, M.A., President, in the chair.—The following were elected Fellows of the Society:—Miss Margery H. Briggs, B.Sc., 7, Winterstoke Gardens, Mill Hill, N.W.; Messrs. Edward Ballard, Zomba, Nyassaland; George Trevor Lyle, Bank House, Brockenhurst; Rev. J. W. Metcalfe, The Vicarage, Ottery St. Mary; Kurt, Baron Rosen, Zoologische Staatssammlung, Munich.—The Rev. G. Wheeler, one of the Secretaries, announced that the Council had nominated the following Fellows as Officers and Council for the Session 1913–1914:—President, George T. Bethune-Baker, F.L.S., F.Z.S.; Treasurer, Albert Hugh Jones; Secretaries, Commander J. J. Walker, M.A., R.N., F.L.S., and the Rev. George Wheeler, M.A., F.Z.S.; Librarian, George Charles Champion, A.L.S., F.Z.S. Other members of the Council, Robert Adkin, James E. Collin, John Hartley Durrant, Stanley Edwards, F.L.S., F.Z.S., Harry Eltringham, M.A., F.Z.S., A. E. Gibbs, F.L.S., F.Z.S., Rev. F. D. Morice, M.A., Gilbert W. Nicholson, M.A., M.D., Hon. Nathaniel Charles Rothschild, M.A., F.L.S., F.Z.S., W. E. Sharp, J. R. le B. Tomlin, M.A., Colbran J. Wainwright.—Mr. W. A. Lamborn exhibited (1) a small company of the Nymphaline butterfly *Euphedra ravola*, Hew., which he had bred in August last from larvæ found together under one leaf near Oni Camp, Lagos: (2) two bred families of the Pierine butterfly *Leuceronia argia*, Fabr., with the female parent in each case.—Mr. E. C. Bedwell, specimens of *Lasiosomus enervis*, H.S., one of the rarest of the British Lygæidæ.—Mr. O. E. Janson, specimens of a remarkable Mantid oötheca from Delagoa Bay that had been described and figured by the late Mr. Shelford.—Mr. E. C. Joy, two aberrant specimens of *Colias edusa*, bred from Folkestone in October last.—Dr. K. Jordan, two nests of *Eucheira socialis* recently received from Western Mexico. The caterpillars of this Pierine butterfly live gregariously in an opaque nest of silk, which has an aperture at the lower end. Pupation takes place in the cavity of the nest, the pupæ being suspended by the tail, as in the case of Nymphalidæ.—The following papers were read:—"Notes on Various Central American Coleoptera, with Descriptions of New Genera and Species," by G. C. Champion, A.L.S., F.Z.S., F.E.S.; "The Butterflies of the White Nile, a Study in Geographical Distribution," by G. B. Longstaff, M.A., M.D., F.E.S. A considerable discussion took place on the subject of Dr. Longstaff's paper.

Wednesday, December 4th, 1912.—The Rev. F. D. Morice, M.A., President, in the chair.—Mr. C. A. Foster, Worcestershire Regiment, Beechwood, Ifley, Oxford, was elected a Fellow of the Society.—The President announced the death of Mr. W. F. Kirby, formerly Honorary Secretary of the Society.—Mr. Waterhouse exhibited a diagram of the oötheca of a *Mantis* and read notes upon it.—Mr. W. J. Kaye, a number of butterflies with one moth belonging to the principal Müllerian Association as found in Costa Rica. A number of specimens, both set and unset, of the principal Müllerian group from Caracas, Venezuela, were also shown, to exhibit the far closer resemblance of the under sides than the upper sides.

From Santos, S. E. Brazil, were shown the principal members of a synaposematic group to call attention to a member of the group that had not been previously mentioned. The species was *Pericopsis isse*, a Hypsid moth.—Dr. G. B. Longstaff, a small box of Chrysidæ, and started an interesting discussion on the means by which the metallic coloration was produced.—Mr. J. Platt Barrett, series of *Melanargia japygia* and *M. galatea* from Sicily.—Mr. G. T. Porritt, a series of *Platycleis roeselii* taken by himself at Trusthorpe, on the Lincolnshire coast this year.—Mr. W. A. Lamborn supplemented his previous account of two families of bred *Leuceronia argia* by referring to a short series of females taken at Oni between April 1st, 1910, and January 25th, 1911, a period including a whole wet season and a part of two dry seasons.—Mr. J. A. Simes exhibited a short series of *Parnassius apollo* from the Government of Viatka, with a series from the Alps of Dauphiny and Switzerland for comparison.—Professor Poulton said that at his desire Miss Fountaine had kindly prepared an account of the extremely interesting family of *Papilio dardanus* reared by her in 1909—the only Natal family at present known in which *cenea* is other than the most numerous of all the forms. He exhibited a male specimen of *P. arenaria*, taken by Dr. G. D. H. Carpenter on Bugalla, one of the Sesse Islands. *P. arenaria* had been shown by Dr. Karl Jordan to be a pale eastern geographical race of the fulvous *P. consanguinea* of the tropical west coast. It was therefore interesting to find such forms, tending towards an intermediate tint, in an island in the Victoria Nyanza. Professor Poulton also exhibited thirty-seven examples of *Rumicia phlæas*, captured on the same bank at Cerne Abbas, Dorset, in the hot August of 1911 and in the cold August of 1912, by Dr. R. C. L. Perkins. Eight out of the fourteen males captured in 1911 were much darker than any of the eight males captured in 1912. The copper tint of the eight 1912 females was more brilliantly lustrous than in the seven 1911 females.—Mr. T. H. L. Grosvenor, a series of *Polyommatus icarus* females principally from various localities on the North Downs, arranged according to the year and emergence to which they belonged.—The Rev. G. Wheeler, on behalf of Mr. R. M. Prideaux, some aberrational forms of *Rumicia phlæas* and three female “Blues,” consisting of one very dark specimen of *Agriades corydon* and two of *A. thetis*, one being of the ab. *urania*, Gerh., and the other having the fore wings dark and the hind wings symmetrically of a pale fawn-colour. Also the specimens of *Agriades thetis* ab. *urania*, Gerh., to which he had referred at a former meeting. All were taken between Gomshall and Dorking and were first-brood specimens of this year. Also a series of blue females of *Polyommatus icarus*, most of them entirely blue, taken this spring at Notgrove in the Cotswolds, and for comparison the bluest female he had taken there previously, in which the blue scaling was less than the least blue of this spring's captures.—Dr. F. A. Dixey, specimens of *Teracolus ephyra*, Klug, and some allied forms, together with drawings of their respective scent scales.—The following papers were read:—“On some New and little-known Bornean Lycenidæ, with a Revision of the Thecline Genus *Thamala*, Moore,” by J. C. Moulton, F.L.S., Curator of the Sarawak Museum; “Descriptions of South



American Micro-Lepidoptera," by E. Meyrick, B.A., F.R.S.; "Synoptic Table of the British Species of *Aleuota* and *Atheta*, Th.," by Malcolm Cameron, M.B., R.N.; "Comparative Notes on *Chiladse galba*, Lea., and *C. phiala*, Gr.-Gr.," by G. T. Bethune-Baker, F.L.S., F.Z.S.; "Notes on the Specific Distinction of Certain Species in the *orbitulus* and *pheretiades* Section of the Genus *Plebeius*," by G. T. Bethune-Baker, F.L.S., F.Z.S. Mr. Bethune-Baker exhibited the species referred to in the latter paper, and mentioned the conclusions to which he had come as to their specific value or otherwise.—GEORGE WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 24th, 1912.—Mr. A. E. Tonge, F.E.S., President, in the chair.—The Secretary exhibited four specimens of *Abraxas grossulariata* ab. *variegata*, presented to the Society's cabinet by Mr. G. T. Porritt.—Mr. Ashdown, a collection of butterflies made during his holiday in Switzerland in June and July.—Mr. Colthrup, a series of very fine photographs of Lepidoptera at rest, and of famous entomological localities.—Mr. Newman, the one *Colias edusa* and four var. *helice* he had bred this year from a captured var. *helice*; some *Pyrameis atalanta* with smoky-red bands; and a fine series of autumn-bred hybrids, *ocellatus-populi*, showing much variability. These last had not been forced.—Mr. Tonge, a long series of *Tephrosia historta*, second brood, bred from a female from Tilgate Forest, captured in the spring.—Mr. Kaye, an uncommon Pyrale, *Aglossa cuprealis*, captured in his house at Surbiton.—Mr. Edwards, the exotic Papilios, *P. cacicus*, from South America, and *P. helleri* and *P. andremon* from Mexico.—Mr. L. Gibb, a living example of *Polygonia c-album*.—Mr. Adkin, short series of *Eupithecia innotata* and *C. fraxinata*, and initiated a discussion on the specific stability of these as two separate species.—Mr. Grosvenor, two drawers of *Pieris napi*, showing the geographical variation occurring in the British Isles.—Mr. Sheldon, all the species of the genus *Erebia* known to occur in Scandinavia and which he had taken in his trips there during 1911 and 1912.

November 14th, 1912.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. H. W. Martin and Mr. Ronald Marshall, of Bexley, were elected members.—Mr. B. H. Smith presented a large collection of British mosses to the Society's reference collections. The specimens were mounted and contained in thirty-one volumes.—Mr. Newman, twigs of sallow extensively attacked by tits for the larvæ of beetles and the mites in the nodules caused by the last; long and variable series of *Polia chi* from Sheffield, mostly dark; and several series of *Melitæa aurinia*, including a very variable series bred at Birmingham, and a very uniform series bred at Bexley, both series originating from the same localities.—Mr. Sheldon, series of the Brenthids taken by him in Lapland this year, viz., *B. frigga*, *B. freija*, *B. polaris* and *B. pales* var. *lapponica*, with series of *Cœneis jutta* and *C. norna*, pointing out the extreme variability of the last-named.—Mr. F. H. Grosvenor, a long series of *B. perla* from Deal, where it occurred in abundance in late August.—Mr. Tonge, the same species and a short series of *B. muralis* from the same place, including an



ab. *impar* and a specimen as small as *B. perla*.—Mr. Bacot, a curious mimetic Acriidian from Portuguese West Africa, which rested on the charred stumps of vegetation burnt annually, and showed very perfect protective resemblance.—Mr. Gardner, long and varied series of British Lepidoptera, including *Boarmia repandata* from North Devon, with var. *conversaria* and many intermediates; *Hypsipetes sordidata* from Forres, probably bilberry forms, many being very extreme; *Larentia didymata* from many localities indicative of local races, and *Melanippe fluctuata*, including varied London forms and aberrations, with dark Scotch and Shetland forms.—Mr. H. Main, the galls of *Biorhiza aptera* on the rootlets of the oak, some cut open to show the workings, the larvæ, and the parasitic larvæ.—Mr. W. J. Kaye, a fine set of the species of butterflies forming the principal Müllerian association in Costa Rica, including fourteen species of Ithomiinæ, three species of Heliconiinæ, one Pierinæ, one *Eresia*, and a new species of *Castnia*. He also showed a smaller, similar, mimetic group from Caracas, Venezuela.—Mr. Sheldon, the series of *Eupithecia innotata* and *E. fraxinata* referred to by him at the previous meeting.—Lantern slides were exhibited by Mr. W. West (Ashted), sporangia of Myxomycetes; Dr. Chapman, the delegates to the International Congress; Mr. Tonge, ova of Lepidoptera *in situ*; Mr. Main, life-histories of the snake-fly (*Raphidia*), the alder-fly, and the "jumping" saw-fly (*Phylotoma*); and Mr. Dennis, galls caused by aphids and mites.—HY. J. TURNER, *Hon. Rep. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—The first meeting of the 1912-13 Session was held in the Manchester Museum on October 2nd, 1912.—The following exhibits were made:—Mr. R. Tait, Jr., series of *Agrotis ashworthii* from North Wales, including a number of dark specimens; *Nyssia zonaria* bred from ova laid by a North Wales female; *Melitæa aurinia* bred from Irish larvæ; *Geometra papilionaria* bred from Delamere larvæ; *Tephrosia luridata* bred from Wyre Forest ova; *Cucullia chamomillæ* from Carrington Moss, Cheshire; a bred series of *Ennomos autumnaria*. Series from South Devon (taken in June, 1912) of *Leucophasia sinapis*, *Melanippe procellata*, *Larentia galiata*, *Ligdia adustata*, *Bapta temerata*, and *Colias edusa*; also a variety of *Agrotis exclamationis*. He also showed a fine series of *Boarmia repandata*, including the melanic form from North Wales, a different melanic form from Durham, and a pale form from South Wales.—Mr. W. P. Stocks, F.R.C.S., a large number of species, which included:—From Silverdale: *Nemeobius lucina*, *Ino geryon*, *Nola confusalis*, *Grammesia trigrammica*, with var. *bilinea* inclining to var. *obscura*, *Ligdia adustata*, *Bapta temerata*, *Malenydris salicata*, &c. From Baslow: *Xanthorhœ fluctuata* var. *costovata*, a beautiful example; *Bryophila perla*, a series. From Selkirk: *Pygæra pigra*. From Fowey: *Diaphora mendica*.—Mr. C. F. Johnson, series of *Ligdia adustata*, *Ino geryon*, and *Semiothisa alternata*, from Witherslack; *Lophopteryx camelina*, *Tephrosia luridata* and *Pachys strataria*, bred from larvæ beaten in Wyre Forest; a peculiar buff-coloured specimen of *Opisthograptis luteolata*, taken at Stockport.—Mr. W. Mausbridge, series of *Nyssia zonaria*, from Crosby sandhills; *Gonodontis bidentata* with var. *nigra*, from Brad-

ford parents; *Ematurga atomaria*, from Delamere, with melanic variety from Burnley; *Mamestra glauca* with dark variety, and *Coremia ferrugata*, both spring and July forms, showing seasonal variation—from Burnley; blue females of *Lycæna icarus*, from the Crosby sandhills; vars. of *Abraaxas grossulariata* bred from wild Huddersfield larvæ; *Boarmia repandata*, with a pair of var. *nigra*, bred from Delamere Forest—the first var. *nigra* Mr. Mansbridge has taken in that locality; a slaty form of *Boarmia gemmaria* from the Liverpool district; *Aplecta nebulosa* with var. *robsoni* and *Sesia culiciformis*, from Delamere.—Mr. B. H. Crabtree:—From Lakeside, Windermere: bred series of *Dasychira pudilunda* and *Acronycta psi*; series of *Nemeobius lucina*, *Thanaos toges*, and *Argynnis euphrosyne*. A bred series of *Abraaxas grossulariata* from Huddersfield. Varieties of *Arctia caia* from wild Altrincham larvæ.—Mr. A. E. Wright, the following series: *Nyssia zonaria*, from Blackpool; *Cucullia chamomillæ*, from St. Anne's-on-Sea; *Hybernia marginaria* var. *fusca*, from Burnley and St. Anne's-on-Sea; *Lygris testata*, from Burnley, including one dark male; *Anticlea badiata*, from St. Anne's-on-Sea and Burnley; a long series of *Hybernia leucophæaria*, including a number of var. *marmorinaria* from Delamere; *Ligdia adustata*, *Lomaspilis marginata*, and *Nemoria viridaria*, from Witherslack; a fine series of *Ematurga atomaria*, from Witherslack, Delamere, and Burnley, including black forms, both sexes; *Mamestra glauca*, from Burnley and Cannock Chase; *Eupithecia succenturiata*, from Southport.—Mr. W. Buckley, bred series of *Boarmia repandata*, *Agrotis ashworthii*, *A. agathina*, and *Noctua brunnea*, from Penmaenmawr; *Dianthæcia conspersa*, from Anglesea, which had been three winters in pupa.—Mr. L. Nathan, bred *Dasychira fuscelina*, from Southport larvæ; *Papilio machaon*, from Wicken Fen, &c.—Mr. J. H. Watson, male and female living leaf-insects, *Pulchryphyllum crurifolium*, from Ceylon, bred by Dr. Russell from ova sent last year; two boxes of *Parnassius apollo*, showing about fifteen subspecies.—Mr. J. E. Cope, the following Coleoptera:—*Carabus glabratus*, *C. granulatus* (dark form) and *C. catenulatus* (small form), taken by Mr. A. W. Boyd in the Lake District, in 1912; *C. catenulatus* and *granulatus* (light form) from Ashton Moss; *Ocypus olens*, from Ashton Moss; *Melolontha vulgaris*, from Delamere; *Gnorimus nobilis*, from Worcester; also *Phyllotreta nemorum*—the northern turnip-flea.

November 6th, 1912.—Meeting in the Manchester Museum.—Mr. C. F. Johnson exhibited part of a collection of butterflies made in 1912 at Vernet-les-Bains, St. Martin-du-Canigon, and Mont Canigon in the Pyrenees. A number of species were shown, including *Erebia lefebvrei*, *E. epiphron* var. *pyrenaica*, &c., and in some cases the corresponding English form was shown.—Mr. W. Mansbridge showed, on behalf of Mr. R. Tait, Jr., a long and varied series of *Agrotis agathina* bred in 1912 from larvæ from North Wales, including some splendid examples.—Mr. J. H. Watson, living Coleoptera—*Brachycerus paganus*, from Delagoa Bay; specimens of *Hemileuca neu-morgenii* and *H. burnsi*, for comparison; a large number of lepidopterous cocoons, taken from a cargo of Rangoon rice at Birkenhead.—Mr. B. H. Crabtree, a very grey example of *Saturnia carpinii* from Essex, with a yellow dash at the tip of the wing.—Mr. J. Ray Hardy

a rare beetle, *Lyctus brunneus*, bred from Sherwood Forest.—A. W. BOYD, M.A., *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Liverpool, November 18th, 1912.—Dr. P. F. Tinne, Vice-President, in the chair.—Mr. F. C. Burne and Miss Dorith Ida Burne, of New Brighton, were elected members of the Society. — Mr. Wm. Mansbridge read a paper entitled "Moorland Collecting," which dealt with the Lepidoptera to be found on the high moorlands of Lancashire and Yorkshire; a discussion ensued, in which many of the members took part.—Exhibits were as follows:—Mr. W. A. Tyerman, a beautiful series of *Epunda nigra* bred from Devonshire ova.—Mr. F. N. Pierce, a short series of *Melileuca ocellaris* from the Thames valley.—Dr. P. F. Tinne, a small collection of Sphingidæ from British Guiana.—Mr. Wm. Mansbridge, *Thera variata* from Bournemouth, with notes.

The Annual Meeting of the Society was held at the Royal Institution, Colquitt Street, Liverpool, on Monday, December 16th, 1912.—Dr. P. F. Tinne, Vice-President, in the chair. —Mr. Charles Percy Rimmer, Liverpool, was elected a member of the Society.—The following members were elected Officers and Council of the Society for 1913:—President: F. N. Pierce, F.E.S.; Vice-Presidents: R. Wilding, Wm. Webster, Hugh Main, B.Sc., F.E.S.; Treasurer: J. Cotton; Librarian: F. N. Pierce; Hon. Secretary: Wm. Mansbridge, F.E.S.; Council: C. B. Williams, R. T. Cassall, F.E.S., L. West, H. S. Leigh, F.E.S., A. E. Gibbs, F.L.S., F.E.S., A. W. Boyd, M.A., F.E.S., C. E. Stott, F. S. Tinne, M.A.—The Vice-Presidential address by Mr. Claude Morley, F.E.S., entitled "Ichneumons," was read, and a vote of thanks to the author was unanimously carried.—The following exhibits were made, *viz.*:—Mr. F. N. Pierce, *Dianthæcia luteago*, *D. barrettii*, and *D. argillacea*.—Mr. Rimmer, a small collection of Macro- and Micro-Lepidoptera, including *Polyommatus phlæas* var. *schmidtii*, a specimen from Anglesey, and a specimen of *Amphipyra pyramidea* from Carnarvon.—WM. MANSBRIDGE, *Hon. Sec.*

## RECENT LITERATURE.

*The Beginner's Guide to the Microscope.* By CHAS. E. HEATH, F.R.M.S. Percival Marshall & Co. Pp. 1-119.

As a guide to the construction of the microscope this is certainly quite a useful production, dealing with this section of the subject far more fully than does the average beginner's book. The principle of the microscope is explained at some length and useful hints are given as to the care and manipulation of the instrument. Unfortunately the section dealing with the preparation and mounting of objects, though forming quite a helpful general guide and containing much that is essential, seems altogether too short in proportion, occupying, as it does, a bare thirty pages of the text.

N. D. R.



*Annals of Tropical Medicine and Parasitology.* Series T. M., vol. vi., No. 4. Liverpool, December, 1912.

BESIDES articles of less interest to entomologists, this number contains:—(1) "Experiments on *Cimex lectularius*," by Dr. B. Blacklock. (2) "Three New African Species of *Tabanus*," by H. F. Carter—*T. nagamiensis*, *T. fulvicapillus*, and *T. donaldsoni*. (3) "Sex of Mosquito Larvæ," by Helen A. Adie.

W. J. L.

*The Entomologist's Log-Book.* A Dictionary of the Life-histories and Food-plants of the British Macro-Lepidoptera. Giving many thousands of Facts and Data connected with the appearance of the Ova, Larvæ, Pupæ, and Imagines; Methods of Capture; Habitats; Food-plants; Authorities: Synonyms, &c., in Latin and English throughout, and interleaved for private notes. By ALFRED GEORGE SCORER, F.E.S., &c. Pp. i.-vii. and 1-374. London: George Routledge & Sons, Limited. 1913.

As will be gathered from the analysis of contents appearing on the title-page, this bulky volume is not only an epitome of recorded facts concerning British Macro-Lepidoptera, but as it is interleaved with blank paper, space is provided for additional matter, new or otherwise, that it may be desirable to enter. In almost every case useful notes in reference to larva and pupa, as well as imago, are given.

As the subjects are arranged alphabetically, there is no difficulty in turning up details of insects or food-plants, even when only their English names are known.

The preparation of a work of this kind is little short of actual drudgery, and we heartily congratulate Mr. Scorer on the highly successful result of his labour. It appeals to all lepidopterists, but will be of the greatest value to the field worker.

*United States Department of Agriculture. Bureau of Entomology:—*

Bulletin No. 95, Part iv.: The so-called "Curlew Bug" (*Sphenophorus callosus*, Oliv.). By F. M. Webster (April 10th, 1912). Part v.: The False Wireworms (*Eleodes*) of the Pacific Northwest. By James A. Hyslop (April 22nd, 1912). Part vi.: The Legume Pod Moth (*Etiella zinckenella schisticolor*, Zell.); The Legume Pod Maggot (*Pegomya planipalpis*, Stein.). By James A. Hyslop (May 31st, 1912). Part vii.: The Alfalfa Looper. By James A. Hyslop (October 16th, 1912).

Bulletin No. 96, Part v.: The Broad-bean Weevil (*Larva rufimana*, Boh.). By F. H. Chittenden, Sc.D. (August 6th, 1912). Part vi.: The Cowpea Weevil. By F. H. Chittenden, Sc.D. (Oct. 17, 1912).

Bulletin No. 97, Part vii.: The Grape Scale (*Aspidiotus uvæ*, Comst.). By James F. Zimmer (May 4th, 1912).

Bulletin No. 98: Historical Notes on the Causes of Bee Diseases. By E. F. Phillips, Ph.D., and G. F. White, Ph.D., M.D. (March 26th, 1912).

Bulletin No. 100: The Insect Enemies of the Cotton Boll Weevil (*Anthonomus grandis*, Boh.). By Dwight Pierce and others (April 3rd, 1912).



- Bulletin No. 106: The Life History and Bionomics of some North American Ticks. By W. A. Hooker, F. C. Bishopp, and H. P. Wood (September 7th, 1912).
- Bulletin No. 108: Leafhoppers affecting Cereals, Grasses, and Forage Crops. By Herbert Osborn (September 12th, 1912).
- Bulletin No. 109, Part iv.: A Little-known Cutworm (*Porosagrotus velusta*, Walk.). By F. H. Chittenden, Sc.D. (April 5th, 1912). Part vi.: The Sugar-Beet Webworm (*Loxostege sticticalis*). By H. O. Marsh (September 16th, 1912).
- Bulletin No. 110: The Spring Grain-Aphis or "Green-bug" (*Toxoptera graminum*). By F. M. Webster (September 6th, 1912).
- Bulletin No. 112: Preliminary Report on the Alfalfa Weevil (*Phytomus posticus*, Gyll.). By F. M. Webster (May 14th, 1912).
- Bulletin No. 115, Part i.: Life-history Studies of the Codlin Moth (*Carpocapsa pomonella*, L.) in Michigan. By A. G. Hammar (August 9th, 1912).
- Bulletin No. 116, Part i.: Spraying Experiments against the Grape Leafhopper (*Typhlocyba comes*, Say) in the Lake Erie Valley. By Fred Johnson (July 15th, 1912).
- Technical Series:—No. 16, Part vi.: Catalogue of Recently Described Coccidæ. By E. R. Sasser (October 19th, 1912). No. 19, Part iv.: The Chalcidoid Genus *Perilampus* and its Relations to the Problems of Parasite Introduction. By Harry S. Smith (April 22nd, 1912). Part v.: Experimental Parasitism: a Study of the Biology of *Limmerium validum* (Cresson). By P. H. Timberlake, A.M. (May 29th, 1912).
- No. 20, Part v.: A Preliminary Synopsis of Cerambycoid Larvæ. By J. L. Webb (August 14th, 1912).
- No. 22: The Structure of Certain Dipterous Larvæ, with Particular Reference to those in Human Foods. By Nathan Banks. (January 10th, 1912).
- No. 23, Part i.: Some New Californian and Georgia Thysanoptera. By Paul R. Jones (January 26th, 1912). Part ii.: An Internal Parasite of Thysanoptera. By H. M. Russell (April 27th, 1912).
- No. 24: The Life-history of the Alder Blight Aphis (*Prociphilus tessellata*, Fitch). By Theo. Pergande (April 29th, 1912).
- No. 25, Part i.: Studies on a New Species of *Toxoptera*, with an Analytical Key to the Genus and Notes on Rearing Methods. By W. J. Phillips and J. J. Davis (May 4th, 1912).

OBITUARY. — The late Rev. J. SANDY BROWN, whose death was noticed in the 'East Anglian Daily Times' of the 19th ult., was the *doyen* of the Norfolk and Norwich Naturalists' Society, now in its forty-third year. He was a good all-round naturalist, clever at photography, and an expert with the microscope, having made a collection of some two thousand specimens of natural history. During his search for these he came across one of our rarest British Hemiptera, *Aphelochirus æstivalis*, in the Norwich River. When I last saw him ten years ago he gave me all his dredging-nets.—W. H. TUCK.





1-6. *OIKETICUS TOWNSENDI*, *CHL.* 7. *EPICNAPTERA DYARI*, *Rivers.*  
8. *EPICNAPTERA DYARI*, *Dyer.*







1



2



3



4

Photo W. J. Lucas.

West, Newman proc.

Fig. 1. Appendage of eighth ventral segment of *CHLOROPERLA VENOSA*.  
Fig. 2. Appendage of eighth ventral segment of *C. GRAMMATICA*.  
Fig. 3. *C. VENOSA*.      Fig. 4. *C. GRAMMATICA*.

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## ILLUSTRATIONS OF AMERICAN LEPIDOPTERA.

BY OLIVE J. COCKERELL.\*

(PLATE V.)

*Oiketicus townsendi*, Cockerell, Ann. Mag. Nat. Hist. 1895, xv. p. 208. Fig. 1.—Male moth. Fig. 2.—Male larva, natural size. Fig. 3.—Anterior end of male larva, enlarged. Fig. 4.—Head and thorax of female larva, enlarged. Fig. 5.—Bag of larva, on apricot tree. Fig. 6.—Bag of larva, on tornillo (*Strombocarpa*).

Fig. 7.—*Epicnaptera dyari* (Rivers), Canad. Entom. 1893, p. 144.

Fig. 8.—*Tolyte brevicrista*, Dyar, Canad. Entom. 1895, p. 246. From a cotype.

These were all collected in the Mesilla Valley, New Mexico.

## AN ADDITION TO THE LIST OF BRITISH PLECOPTERA: RE-INSTATEMENT OF *CHLOROPERLA VENOSA*.

BY KENNETH J. MORTON, F.E.S.

(PLATE VI.)

In the "Catalogue of British Neuroptera" by McLachlan and Eaton (Ent. Soc. Lond. 1870) two species of *Chloroperla* are listed, viz. *C. rivulorum*, Pict., and *C. grammica*, Poda. The

\* My sister Olive Cockerell (1869–1910), when living with me in New Mexico, made a number of drawings for Dr. A. S. Packard, intended to illustrate his volumes on American moths. Two of Dr. Packard's volumes have been published, and on examining the MSS. he left, it is found that a third (Saturniidae and Hemileucidae) can be issued, but beyond this there are only miscellaneous fragments. As the drawings now presented represent hitherto unfigured species, I have sought and obtained Mrs. Packard's kind permission to publish them.—T. D. A. C.

former is a well-known insect in the Alps of Central Europe, where it is common; that it occurs in the British Isles is extremely doubtful. McLachlan himself latterly held this view, and, I think properly, the species has been dropped from our lists.

Stephens applied names to quite a number of forms, but of these, *C. fuscipennis*, *C. lateralis*, *C. media*, and *C. venosa* were all swept by McLachlan without question into the synonymy of *C. grammatica*, while *C. rufescens* of Stephens is also referred to *grammatica* with a mark of interrogation.

During many years I have examined a very large number of British specimens of *Chloroperla*, fresh, dried, and in fluid (spirit and formalin). Although the materials presented a certain amount of variation, there was nothing to seize, and until quite recently I had never seen any British specimens that could have been separated from what has been regarded as *C. grammatica*. However, Prof. J. W. Carr, of University College, Nottingham, recently sent me a rather important lot of Neuropteroid insects for identification, and amongst these are eight examples of *Chloroperla*, which, with one exception, are obviously quite different from *C. grammatica*. Prof. Carr having very kindly given me permission to "mutilate" or otherwise deal with the material as I thought fit, I have been enabled to determine the seven examples referred to as the species to which Klapálek has applied the name of *C. venosa*, Steph. ('Die Süßwasserfauna Deutschlands, 1909; Plecoptera,' p. 48).

Like many of the smaller Plecoptera, the species of *Chloroperla* when dried are usually rather troublesome to determine, and they do not possess the complicated genitalia and armature which in *Nemoura* and *Leuctra* afford splendid characters when these have been revealed after preparation in caustic potash. These greenish Plecoptera appear, as a rule, to have less chitine in their structure, and as they do not stand caustic well they make less satisfactory balsam mounts. It should, however, be possible to separate the two species of *Chloroperla* now under consideration, even in a dried condition, and the following attempt to define the differences may be useful. In this I have not confined myself absolutely to the dried specimens, but have also used balsam mounts and examples preserved in formalin, the last-mentioned kindly mounted for me, without further preparation, by Mr. Martin E. Moseley in cells filled with the same fluid, being specially useful. The form of the appendage of the eighth ventral segment in the male, and of the subgenital plate in the female, are of themselves sufficient to separate the two, but in dried specimens these parts will often be found none too conspicuous.

*C. grammatica.*

Distance between the hind pair of ocelli considerably less than double the distance between these ocelli and the eyes.

Head ochreous yellow; marking between ocelli horseshoe-shaped; as a rule, clearly defined in the dry insect.

Pronotum ochreous yellow, only the warty portions of the side fields brownish.

Mesonotum chestnut-brown; the præscutum, the two lobes of the scutum and the anterior narrow part of the scutellum lying between the lobes of the scutum yellowish; the three latter parts, being outlined in brown, form a somewhat broadly cordate marking (from examples in formalin).

Neuration yellowish green, not very prominent; in fore wings, costa, outer part of radius, of sector radii, and of median, also outer cross-veins and a part of the anterior cubitus, brownish.

Setæ, as a rule, not distinctly annulated.

Appendage of eighth ventral segment of male broader than long.

Subgenital plate of female rounded.

*C. grammatica* is a widely spread species and usually common at clear rivers and streams.

Of *C. venosa* I have seen only the specimens sent by Prof. Carr, which bear the following data:—

Stoke Bardolph, May 11th, 1911, F. M. R. One male, one female.

River Trent, Nottingham, May 10th, 1912, H. Mottram. One female.

Nottingham, May 14th, 1912, H. Mottram. One male.

*C. venosa.*

Distance between the hind pair of ocelli double or rather more than double the distance between these ocelli and the eyes.

Head with the dark markings more extended and more suffused, the yellow between the ocelli often reduced to a mere spot.

Only middle field and outer margins of pronotum yellowish, the remainder usually dark in dried specimens.

Middle of præscutum yellow, the pale colour being continued usually as a rather narrow line on the anterior part of the scutellum, the lobes of the scutum remaining nearly altogether brown (from examples in formalin taken in Norway).

Wings more hyaline; neuration of fore wings rather strong and nearly all brown, excepting the veins at the base, the radius which is pale to the sector, and the subcosta which is yellow throughout.

Setæ rather distinctly annulated.

Appendage longer than broad; chitinized portion coloured in a way that gives the appendage the appearance of being contracted about the middle.

Subgenital plate of female triangular.



Radcliffe-on-Trent, May 25th, 1912, J. W. Carr. One male, one female.

Radcliffe-on-Trent, May 29th, 1912, J. W. Carr. One male.

It seems very probable that confusion exists between this species and *C. griseipennis*, Pict., and that more than one writer, including myself, has recorded from Continental rivers what is here termed *C. venosa* under the name of *griseipennis*. Klapálek has applied the latter name to an insect which is, in some respects, very like *C. venosa*, but which is rather more delicate looking, with less strongly marked neuration and with a sharply defined horseshoe-shaped marking between the ocelli.

With regard to the use of the name of *venosa*, I may say at once that it seems very improbable that Stephens knew anything about the insect now under consideration. I have not access to the *Illus. Brit. Entom. Mandib.* vi. p. 139 (1836), but Mr. Herbert Campion has very kindly sent me a copy of what is there written about *Chloroperla venosa*, and as far as I am able to judge it does not apply to Klapálek's species.

The description is as follows:—

“Sp. 4, *venosa*. *Rufescente-ochracea, oculis atris, collaris lateribus abdominisque dorso nigris, alis flavescente-iridibus nervis fuscescentibus*. (Long. corp.  $4\frac{1}{2}$  lin.; exp. alar.  $11\frac{1}{2}$  lin.)

Pe. *venosa*. Steph. Catal. 315. No. 3542.

Reddish ochre, with a greenish tinge; eyes and ocelli black; collar with its lateral margins broadly black; abdomen black above, its sides ochreous-green; legs greenish ochre; antennæ dusky ochreous at the base; wings yellowish green with fuscescent nervures.

Found in June, near London.”

Mr. Campion has also made a very thorough search in the British collections in the Natural History Museum for anything that might throw light on what Stephens's *venosa* really was. The difficulties and unsatisfactory features of such a search have already been alluded to elsewhere (*Entom.* 1911, p. 82). A specimen, against which Stephens's drawer label “*venosa*” has been placed, was received by the Museum direct from J. C. Dale in 1862, and consequently could not have been Stephens's type; it appears to be *grammatica*. Further, Mr. Campion has practically satisfied himself that none of the examples of *Chloroperla* which he has examined are conspecific with one of Prof. Carr's specimens which I had sent to him for comparison. My best thanks are due to him for his painstaking efforts to solve the difficulties surrounding the identification of Stephens's species.

I suppose that Klapálek, following the *Brit. Mus. Cat.* (Phryganides-Perlides, 1852), identified his species with the insect that Pictet had described and figured (*Hist. Nat. Neur. Perl.* 297, 62, pl. 35, fig. 1-3) under the name of *venosa*, Steph.



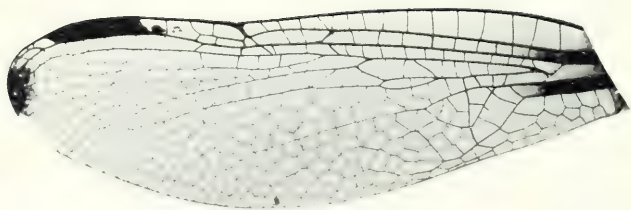


Photo F. W. & H. Campion.

West, Newman proc.

LIBELLULA FULVA. Müll., ♂.

It has already been indicated that there is at present no evidence available to support the view that the latter is the same as Klapálek's *venosa*. Klapálek, however, has clearly defined the insect that he meant, and I follow the course of reinstating the name *Chloroperla venosa* into the British list, although such a course in the circumstances is not very satisfactory.

EXPLANATION OF PLATE VI.—Fig. 1.—Appendage of eighth ventral segment of *Chloroperla venosa*. Fig. 2.—Appendage of eighth ventral segment of *C. grammatica*. Fig. 3.—*C. venosa* (imago). Fig. 4.—*C. grammatica* (imago). For the photographs of the whole insects I am indebted to Mr. Lucas, who has made the very best of rather unsatisfactory subjects.

13, Blackford Road, Edinburgh: December, 1912.

## NOTES ON THE DRAGONFLY SEASON OF 1912.

By F. W. & H. CAMPION.

(PLATE VII.)

ALTHOUGH reports of dragonflies being on the wing reached us well before the end of April, the first imago which we saw alive in 1912 was a rather immature male of *Pyrrosoma nymphula*, taken at the Black Pond, Surrey, by Mr. Norman D. Riley on the 28th of that month.

Dr. F. F. Laidlaw informs us that he saw several males and females of *Calopteryx virgo* in North Devon before the end of April. Mr. G. Meade-Waldo was kind enough to give us a female from Hever, Kent (May 27th), and a pair (male and female) from Dartmeet, South Devon, dated vi-vii, 1912, all taken by himself. *Calopteryx splendens* was, as usual, common near Huntingdon, and specimens were taken on June 19th and 21st. Dr. Laidlaw writes that the species was also abundant at Uffculme, Devon, in June and July.

On June 27th we again met with *Lestes dryas* at Ramsey, Hunts, in ditches filled with a species of *Carex* (apparently *C. riparia*). By that date only a very few specimens had reached the adult condition, and most of them were still quite teneral. Mr. E. A. Waterhouse re-visited the old *dryas* locality near Hanwell, Middlesex, after an interval of a few years, and found that since his last visit it had been entirely spoiled from an entomological point of view.

A male of *Platynemis pennipes* was taken at Hartford, Hunts, on June 19th, and Dr. Laidlaw reports the capture of two males at Uffculme during July. *Ischnura elegans* var. female *infuscans* occurred at Hartford, near Huntingdon, on June 19th. *Agrion pulchellum* was in good condition at Byfleet, Surrey, on



May 12th (H. J. Watts), and further specimens were taken in Huntingdonshire on June 19th (at Hartford), and June 27th (at Ramsey). On May 26th we took a male of *Agrion puella* at Sudbury, Middlesex. *Erythromma naia*s was met with near Huntingdon on June 19th, 21st, and 22nd. A female taken on the last-named date had the left mid-leg re-grown from the base. The right mid-leg also had the tarsus redeveloped, and possessed only a single claw. It is interesting to recall here another specimen of the same species in which we found a regenerated mid-leg (Entom. xl. p. 213 (1907)). At Byfleet Mr. Watts obtained one specimen of *Pyrrhosoma nymphula* var. female *melanotum* on May 12th, and another on June 9th. We do not recollect any previous occurrence of this form in Surrey. In view of the great extent to which the female of *P. nymphula* was observed to vary at Byfleet in the matter of abdominal coloration, Mr. Watts furnished us with a good number of specimens from that locality, taken on May 26th and June 9th. By arranging these specimens in a long series, with the extremely bronzed form (var. *melanotum*) at one end, and the extremely crimson form (var. *fulvipes*) at the other end, we obtained an almost complete set of intermediate forms, with the normal one occupying about the central position. It would appear, therefore, that the female of this species is polymorphic rather than trimorphic, and that the forms called *melanotum* and *fulvipes* are not really well-defined varieties, but are merely the extreme expressions of variation in opposite directions.

At Fittleworth, Sussex, a female of *Gomphus vulgatissimus* was secured by Mr. Watts on May 19th. At the time of capture, he tells us, it was quite teneral, but it assumed the fully adult condition after being kept alive in captivity for a few days.

At Byfleet, on May 12th, Mr. Watts found numerous nymphskins of *Brachytron hafniense* left clinging to freshly grown vegetation. Of eleven skins which we were given an opportunity of examining, five had belonged to males and six to females. On July 12th the species was met with again by the same collector at Potter Heigham, Norfolk. From other sources we received a male of *Æschna grandis*, captured at Sudbury, Suffolk, on August 4th, and a female of *Æ. cyanea*, taken at Horsenden Hill, near Sudbury, Middlesex, on August 1st. Of *Æ. isosceles* we have seen two slightly worn males from Stalham, Norfolk, one taken on July 15th, and the other on July 16th (Watts).

On May 29th we found *Cordulia aenea* flying in some numbers on Oxshott Heath, Surrey, far away from any sheet of water, and one individual was still on the wing as late in the afternoon as 5.30. The next day males were captured, both on the Heath and near the Black Pond.

A female of *Orthetrum cærulescens* was obtained at Uffculme on June 30th (Laidlaw).

On June 22nd, near Huntingdon, a few males of *Libellula fulva* were taken, and in one of them the left fore wing was in a singularly aberrant condition, as will be seen from the accompanying Plate. Not only is it shorter and broader than the corresponding wing on the right side, but the venation is altogether abnormal. Indeed, the homology of some of the veins can hardly be made out at all; but, apart from this, the wing presents several remarkable characters for which parallels can be found in other groups of Odonata. Thus, the pterostigma is very long, and fills as many as three cells: a "false" pterostigma of this kind is present normally in some Zygoptera. The subcosta is prolonged considerably beyond the nodus, as in certain recent *Æschniinae* and in the extinct *Æschnidiidæ*. The triangle is of the "*Pentathemis*" form, and the anal vein, instead of appearing to attach itself in the usual manner to the upper portion of the triangle, takes a downward course towards the hind margin of the wing, as in the *Æschnidæ*. In connection with abnormalities of this kind, Prof. Philip P. Calvert has kindly drawn our attention to Dr. Viktor Janda's valuable paper on regenerated appendages in the Odonata ('Sitzungsber. K. Böhmische Gesell.,' 1909). Several wings of *Æschna* and *Libellula* in various stages of re-growth are figured therein, but none of them are quite so remarkable in their venational peculiarities as the wing of *L. fulva* now under consideration. A living female of *Libellula depressa* from Horeham Road, near Heathfield, Sussex (May 12th), was given to us by Mr. Riley, and Dr. Laidlaw records (*in litt.*) the taking of a male at Uffculme on May 31st. Mr. R. South gave us two females of *Sympetrum striolatum*, taken by himself at Llandrindod Wells, Radnorshire. He came across them, with others, one afternoon in mid-August, during a brief interval of sunshine. Owing, no doubt, to the general prevalence of sunless weather, this was the only occasion upon which dragonflies of any kind were observed by Mr. South during some weeks' residence at the Wells. Males and females of *Sympetrum sanguineum*, in teneral condition, were met with at Ramsey, Hunts, on June 27th. Mr. A. Luvoni showed us an immature male which he had taken at Westcliff, Essex, on July 14th.

Several of the commoner species were met with again in localities recorded for them in previous years, and for that reason they have not been noticed on the present occasion. It may be added that the Huntingdonshire dragonflies mentioned herein were obtained by Mr. J. Peck and ourselves.

EXPLANATION OF PLATE VII.—Upper figure. *Libellula fulva*, Müll., male, with teratological left fore wing, taken near Huntingdon, June 22nd, 1912. Slightly reduced.—Lower figure. The teratological wing, enlarged two and a half times, showing aberrant venation.

A CONTRIBUTION TO THE LIFE-HISTORY OF  
*BRENTHIS FRIGGA*.

BY W. G. SHELDON, F.E.S.



Photo H. Main

Egg-shell of *Brenthis frigga*, magnified 20 diameters.

So far as I am aware, the only particulars that are known of the earlier stages of this species are that a lepidopterist named Schilde in 1871 obtained ova from captured females, and found that the resultant larvæ would feed upon *Rubus chamæmorus*, and that they would also eat birch. These larvæ were not reared.

On July 12th last I obtained several worn females at Laxelv, in the Porsanger Fjord, which, when confined in the sun under gauze, deposited ova thereon freely, in preference to laying them on the various plants growing in the locality in which the females were captured, and which including *Rubus chamæmorus*, *Vaccinium* of three species, sallow, birch, and *Empytrum nigrum*, I had placed under the gauze. Of these ova I kept the major portion, but forwarded some to Mr. H. Main, to whom I gave a list of all the plants, found where the females were captured, that I knew the names of.

The first of my larvæ emerged on July 28th, and the remainder on the following two days. I was then journeying home, but had a supply of *R. chamæmorus* with me, and supplied the larvæ with leaves of this plant, together with those of raspberry, which I found growing wild at Trondhjem, somewhat to my surprise and greatly to my concern, the larvæ—although one or two slightly nibbled the leaves of both these plants—would not eat them at all freely, and by the time I got home on August 4th they were all dead, or nearly so. Fortu-

nately Mr. Main, not having my knowledge of the supposed predilection of the larvæ for *Rubus*, took a wider survey of the food-plant question, and gave them, amongst other plants, sallow, to which rather unlikely pabulum for a Brenthid they took freely, changing into the second stage about a week after emerging from the ova.

On August 12th Mr. Main handed over to me three of his larvæ, which were then in the second stage, retaining himself four, which comprised his remaining stock. Of the three larvæ which I had in charge two refused to feed further, and were evidently prepared to hibernate at once. The remaining one fed upon sallow slowly until August 25th, when it also ceased to feed.

Early in September I placed my larvæ in a cool cellar to pass the winter, but from the first I was doubtful of the treatment being successful, for they commenced at once to shrink in size, and in early October had disappeared from the sides of the flower-pot in which they were placed, and to which they had attached themselves. At the end of January I turned out the pot, and found that the larvæ were dead, and on communicating with Mr. Main, he informed me that his larvæ, which were kept in the open air, had met with a similar fate.

The egg is 1 mm. in height, .85 mm. broad. It has vertical ribs, about twenty-four in number, which are irregular in outline, and are crossed by numerous shallow transverse ribs. The micropylar area is not distinctly separated from the surrounding surface; it consists of a number of shallow cells, not noticeably depressed. The egg is highly glazed and opalescent; it is attached to the object it is deposited on by the female, and is straw-coloured at first, becoming of a leaden hue shortly before the larva emerges.

The larva emerges by eating an irregularly shaped hole at the side of the ovum near the apex. Immediately after emergence it is 2.5 mm. long; head jet black and highly glabrous, the remainder of the segments are deep grey-green and very spiny; each segment is prominent in outline, and contains a row of eight shining black tubercles, each of which emits three light-coloured spines, which are in length about three times the diameter of the tubercle. The head is thickly covered with spines.

In the second stage the larva has a much darker general area, and the tubercles are much more prominent and produced to a sharp point; each tubercle emits a number of black spines (ten or twelve).

February 3rd, 1913.



## NOTES ON THE WINGS OF COLEOPTERA.

## I. THE BRITISH SPECIES OF PTEROSTICHUS.

By D. SHARP, M.A., F.R.S.

I HAVE been for many years interested in the questions connected with the flight of Coleoptera, which are very peculiar, owing to the fact that the anterior wings are passive, so that the posterior are entrusted with the chief part of aerial locomotion. Some very curious points arise from this unusual entomological condition, but they cannot be profitably discussed till we have much more information on the subject. The fragment I here offer is very small, but may be of some use.

I have to thank several friends for assisting me with material, in response to an appeal I made several years ago. Mr. Champion, Mr. Donisthorpe, Dr. Perkins, Mr. W. E. Sharp, and Commander Walker kindly responded to that appeal, and to their assistance is largely due any value these notes may possess.

I have used the arrangement and nomenclature of Fowler's 'British Coleoptera.'

1. *P. (Pæcilus) cupreus*, L.—Fully winged. Wings 10–11 mm. long and 4 mm. wide; elytra,  $7\frac{1}{2}$  mm. long. Six examined, all very similar, and all from the South of England.

2. *P. (Pæcilus) cærulescens*, L.—Fully winged, but the wings comparatively small,  $6\frac{3}{4}$ – $7\frac{1}{2}$  mm. long, and  $2\frac{2}{3}$ –3 mm. wide; elytra,  $6\frac{3}{4}$ –7 mm. long. Three examples seen: one from Scotland—the larger individual—one from Sheppey, and one from Wimbledon; this last is the smaller, and the reduction in size of the wings is very marked. Captured April 16th, 1864.

*P. cupreus* and *cærulescens* are very closely allied, and as they are each variable, it is often difficult to distinguish them. The smaller size of the wings and metathorax in *cærulescens* seems to be the most important distinction. The male characters of the two are very similar.

3. *P. (Pæcilus) dimidiatus*, Ol.—Fully winged. One specimen examined. Wing, 11 mm. by 4 mm.

4. *P. (Pæcilus) lepidus*, Fabr. — Flightless. The vestigial wings small. Four specimens examined: two from Glasgow, August, 1864; two from Nethy Bridge, June, 1907; length  $1\frac{1}{2}$  to fully 2 mm.; of elytra,  $7\frac{1}{2}$ –8 mm. The size differs a little in each specimen, and in each of the two pairs the female has the more elongate wings.

5. *P. (Steropus) madidus*, Fabr.—Flightless. The vestigial wings minute,  $\frac{1}{2}$ – $\frac{3}{4}$  mm. long, and about  $\frac{1}{2}$  mm. wide. Three specimens examined. The vestigial wings are slightly different in each. In this species the metanotum is very short, and the elytra become soldered together at the suture when the insect is

thoroughly mature, so that they can only be taken off as a single plate. This is the case with two of the specimens examined (of the red-legged form from the New Forest). In the other example (var. *concinus*, from Beattock), the elytra readily separated at the suture.

6. *P. (Steropus) æthiops*, Panz.—Flightless. I have examined only one specimen, a female (taken by Brewer in Wales in 1867). The vestigial wings are rather long and narrow, fully 2 mm. long, and about  $\frac{3}{4}$  mm. wide at the base. The elytra are not soldered, and the metanotum is considerably longer than in *P. madidus*.

7. *P. (Platysma) oblongopunctatus*, F.—Fully winged,  $7\frac{1}{4}$  mm. by  $2\frac{1}{2}$  mm. wide; elytra about 7 mm. long. Six specimens examined from New Forest, Forest of Dean, and Bradfield, Berks. There is no noticeable distinction in their wings.

8. *P. (Platysma) orinomus*, Steph. (? *vitreus*, Dej.).—Fully winged. Wings, 9–10 mm. long by 4 mm. wide; elytra,  $7\frac{1}{4}$  mm. long. Three specimens examined, all from Northern Scotland. I am not aware that our species has ever been satisfactorily proved to be the same as the Arctic *P. vitreus*, Dej.

9. *P. cristatus*, Duf.—Flightless. Vestigial wings only 1 mm. long; elytra,  $9\frac{1}{2}$  mm. I have only examined one specimen (a female) of this rare species.

10. *P. (Lyperus) aterrimus*, Payk.—Fully winged. Wings,  $12\frac{1}{2}$  mm. long by  $4\frac{1}{2}$  mm. wide; elytra, 8 mm. long. This appears to be the most amply winged of all our species, but I have examined only one example (a male), taken, I believe, at Whittlesea by Wollaston, upwards of sixty years ago.

11. *P. (Omaseus) niger*, Schall. — Fully winged. Wings,  $13\frac{1}{2}$  mm. by 5 mm.; elytra,  $12\frac{1}{2}$  mm. long. These measurements are those of a large female from Brockenhurst. The species varies a good deal in size. I have examined six other examples from Braemar, &c., and the wings apparently do not vary more than the elytra. In the New Forest this species is frequently unable to fly, although so amply winged, in consequence of a sticky exudation rendering it difficult to unfold the wings.

12. *P. (Omaseus) vulgaris*, L. — Flightless. The vestigial wings take the form of long narrow slips, 4 or  $4\frac{1}{2}$  mm. by 1 mm. wide; elytra, 11 mm. long. I have examined three specimens, two from Brockenhurst, one from Nethy Bridge. The vestigial wings are considerably larger in the southern examples. Schaum says (Ins. Deutschlands, i. 456) that *pennatus*, Dej., is a fully winged form of this species, and this opinion is repeated by others, but I have not met with any statement of the evidence on which it is based.

13. *P. (Omaseus) anthracinus*, Ill.—Flightless. The vestigial

wings rather large and of peculiar form,  $4\frac{1}{4}$  mm. long by  $1\frac{1}{4}$  mm. wide; the greatest width is near the tip, and they are again broader near the base, so that the hind margin is broadly emarginate. I have examined a male and a female taken at Hammersmith fifty years ago. The wings are very slightly larger in the female. A male taken recently at Brockenhurst agrees with the Hammersmith male, except that the wings are slightly shorter, and not so distinctly lobed near the tip.

14. *P. (Omascus) nigratus*, F. — Fully winged. Wings,  $7-10\frac{1}{2}$  mm. long by  $3\frac{3}{4}-4\frac{1}{4}$  mm. wide; elytra,  $5\frac{1}{2}-6\frac{1}{2}$  mm. long.

In this common species the wings vary a good deal in expanse. There is also considerable difference in the size of the individuals, but this difference is exaggerated in the wings. The specimens from the Scotch mountains are probably the form found in Switzerland and called *rhaeticus* by Heer (cf. Schaum, Ins. Deutschl. i. 458); they are considerably smaller than the type, and in five specimens I have examined the wings are uniformly reduced to the minimum mentioned. This depauperated form is not, however, confined to the hill regions, as Commander Walker has sent me a specimen, taken at Oxford, which scarcely differs from the hill individuals in size and in the wings.

It should be noted that, though the wings differ considerably in expanse, they are all of normal shape, and apparently there is no tendency to assume the peculiar shape of the functionless wings of *P. anthracinus*.

I have examined eighteen examples, five of them from the Scottish hills.

15. *P. (Omascus) gracilis*, Dej. — Fully winged. Wings, 9 mm. by  $3\frac{1}{4}$  mm.; elytra, 5 mm. I have examined two individuals, both males (Wicken, Donisthorpe, April 22nd, 1910, and New Forest, May 29th, 1909). The wings are remarkably ample.

16. *P. (Omascus) minor*, Gyll. — Dimorphic; either fully winged or with functionless wings, there being a great gap between the two forms, the wings being in one case about 6 mm. by  $2\frac{1}{2}$  mm., and in the other case about 3 mm. by  $1\frac{1}{3}$  mm. I have examined sixty specimens of this interesting case, and the numbers of the two forms are about equal. Probably the fully winged form is really the more abundant, as I wished to see a good many of the reduced form, and exercised some selection to facilitate this. Considering, first, the fully winged condition: the largest wing is quite  $6\frac{1}{2}$  mm. long, and the smallest  $5\frac{1}{2}$  mm., the length of elytra being about 5 mm. by 4 mm. respectively. The wings are of the usual pointed form, and the nervures are well developed and dark, except that in immature examples there is but little pigmentation.

The reduced form has a rounded-truncate apex of the wing, and the organ does not extend beyond the stigma, the apical



part of the wing being absent, and the stigma much reduced. The nervuration of the basal part of the wing is normal, except for the small size. The vestigial wings vary from about  $2\frac{1}{2}$ – $3\frac{1}{2}$  mm. in length, and the width varies to a somewhat greater degree.

I see no reason for doubting that the two forms are really one species, although the gap between them is so wide. Both the vestigial wings and those fully developed vary somewhat in size, and the one individual having the largest vestiges (about  $3\frac{1}{2}$  mm. long) is particularly interesting, because in it the wings have not only developed in size beyond the stage of usual arrest, but have also the beginning of the peculiar folding and creasing that is so remarkable in the wings of Coleoptera.

I have no evidence that the two forms are distributionally isolated. *P. minor* is a very abundant insect in the South of England, but in Scotland it becomes rare. I have only six Scottish specimens, taken at different times at Thornhill about forty years ago, and they are all of the short winged form.

From Wicken Fen (Donisthorpe, April 22nd, 1910), I have examined eleven specimens; ten are of the fully winged form, and one of the short winged. Chobham (Champion, May 14th, 1910), four specimens, two of each kind. Oxford (Walker, November, 1909), four examples, three long winged, one short. Freshwater, Isle of Wight, one with long, four with short wings. In the New Forest the two forms seem to be about equally common.

It seems to be not improbable that the preponderance of short winged forms in the Scottish fauna suggested by the above may prove to be real.

17. *P. (Argutor) strenuus*, Panz.—Flightless. The vestigial wings varying from 1–2 mm. in length; elytra, 4 mm. long. I have examined twenty-five specimens. The great majority have the vestigial wings just about 1 mm. long. Twenty-two specimens are in this state, fifteen of them being from the New Forest. Two examples have the vestiges about  $1\frac{1}{2}$  mm. long. (Wicken, Donisthorpe, April 22nd, 1910; and Boar's Hill, Oxford, Donisthorpe, April, 1910.) Only one individual has the wing about 2 mm. long (Wicken, Donisthorpe, April 22nd, 1910).

The size has possibly in this case something to do with locality, as all the New Forest examples have the wings minute, while the two examples from Wicken have them in one case of the largest size, and in the other of the intermediate size. Boar's Hill has yielded two specimens of small size, and one of intermediate.

18. *P. (Argutor) diligens*, Sturm.—Flightless. The vestigial wings minute,  $\frac{1}{2}$ – $\frac{3}{4}$  mm. long; elytra,  $3\frac{1}{2}$  mm. long. I have examined thirty individuals, and find but little variation. The localities range from the New Forest to Braemar.



19. *P. (Adelosia) picimanus*, Duftschm. — Fully winged. Wings, 10 mm. by 4 mm.; elytra,  $7\frac{1}{4}$  mm. long. Two specimens examined (Sheppey, Commander Walker).

20. *P. (Pedius) inæqualis*, Marsh. — Flightless. Vestigial wings minute, scarcely  $\frac{1}{2}$  mm. long; elytra almost 4 mm. long. One specimen (Southend, February 14th, 1863).

21. *P. (Lagarus) vernalis*, Gyll. — Fully winged. Wings,  $4-5\frac{1}{8}$  mm. long,  $1\frac{1}{2}-2\frac{1}{4}$  mm. wide; elytra, 4 mm. long.

This is an interesting form, the wings being rather small in proportion to the elytra, and subject to considerable diminution, which, however, occurs rather on the axillary part of the wing, not on the apical part.

I have examined sixteen specimens. Seven from Paignton (Perkins, November 5th, 1909), five of which have the wings conspicuously less than full size, while the other two have very nearly the full length of wing, but with the axillary portion small in size. Five individuals from Wicken (Donisthorpe, April 22nd, 1910) have the wings of full size (slightly over or slightly under 5 mm.). One example (Oxford, November, 1909, Walker) has the wings quite of full amplitude. Two from Boar's Hill, Oxford (Donisthorpe, April, 1909) differ distinctly, one having the wings nearly of full size, while in the other they are markedly reduced, being a little less than  $4\frac{1}{2}$  mm. long. One specimen from the New Forest (May 1st, 1912) has the wings very nearly of full amplitude.

The variation in this species would appear to be peculiar, as though the wings exhibit frequently considerable reduction in amplitude, there is no production of a second form of wing such as exists in *P. minor*. The variation, too, appears to be more affected by locality than it is in other species. But it must be admitted that the number of specimens examined is not enough on which to base any important conclusions.

22. *P. (Abax) striola*. — Flightless. The vestigial wings reduced to small rudiments about  $\frac{1}{2}$  mm. long. The metanotum very short, the elytra soldered. The nearest of all our *Pterostichus* to a really apterous state.

The number of species is twenty-two; ten of them are flightless, eleven are fully winged, while one is dimorphic, having about half its individuals in one or other of the two conditions.

The wings are always present, though in some species the vestiges are quite minute. The vestigial wings, though quite different in shape from the normal wings, exhibit shapes characteristic according to the species. Both normal wings and vestigial wings are apt to exhibit considerable variation—the variation is perhaps greater in the case of the vestiges; this is a point difficult of determination.

Variation does not appear to be connected with sex, and only

in one or two cases with locality. In the peculiar dimorphic *P. minor* I have not found any inkling as to the conditions that determine the resultant form. Those species that are flightless have a more contracted metathorax than the winged forms, and I have suspected that slight differences of this sort exist in the dimorphic species, but it is a difficult point to prove. After dissection the capacity of the metathorax cannot be determined with any certainty.

To prevent misconception, I may add that *Pterostichus* includes an unusually large proportion of flightless forms.

## THE BUTTERFLIES OF THE CSÉHTELEK DISTRICT OF CENTRAL HUNGARY.

BY THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S., and  
CHARLOTTE DE WERTHEIMSTEIN.

So little has been published about the Lepidoptera of Hungary, even in that country itself, that these few notes may possibly be of interest.

Cséhtelek is a village in the Margitta district of the County of Bihar, in Hungary, and is already considerably east of the great plain or alföld, which, however, extends to Margitta. It is, therefore, perhaps superfluous to point out that the real alföld fauna is missing from this district. Cséhtelek is situated in the valley of the Bisztra, a small river rising in the Réz Mountains, some ten kilometres south-east of the village, and flowing from its source for some twenty kilometres in a north-westerly direction, where it joins the Berettyó River near Margitta. The country presents three more or less distinct types of vegetation, all of which intergrade. They are designated in our list by the numbers I., II., III., respectively. The first of these is found on the land bordering the river, which is liable to floods in the spring and more rarely in the autumn. The country here consists of wet, grassy fields, in no sense swamps, used both for hay and grazing. Here *Chrysophanus dispar* var. *rutilus* is found, and many other of the commoner species, such as *Argynnis selene*, *Lycæna argiades*, *L. argus*, and *L. argyrognomon*.

The second type occurs on the sandy hills which border the north side of the river for about two-thirds of its length from the point at which the Bisztra leaves the forest-clad mountains. These hills form the edge of a high plateau which lies between the Bisztra and the upper waters of the Berettyó. At one time much of this land was devoted to plum-orchards, planted in the old style, and consequently the original vegetation was retained. Now but few uncultivated patches remain, though these possess a flora and insect fauna of quite remarkable richness.

Among plants may be mentioned the rare *Cytisus horniflorus*, two species of *Gentiana* (*Gentiana cruciata* and *G. pneumonanthe*), the latter flourishing on dry sandstone! Numerous orchids: *Aster amellus*, *Physalis alkekengi*, and many others.

Among the Lepidoptera are *Colias myrmidone*, *Thecla acaciæ*, *Lycæna alcon*, *L. coretas* var. *decolorata*, *Syrichthus lavateræ*, *Hesperia sidæ*, and others.

Finally, there is the forest region, which at one time approached, and, in fact, mingled with, the two previously mentioned types of country. Forest still clothes much of the Réz Mountains and some of the more flat country, and two small patches exist on the sandy hills. The forests are all used as grazing places for cows and pigs, with the result that the flora is gradually changing, and most of the Lepidoptera are exceedingly rare.

*Neptis aceris*, *Argynnis laodice*, *Satyrus circe*, *S. dryas*, *Erebia blandina*, *Epinephele tithonus*, and *Heteropterus morpheus* may all be cited as typical of the forest region, as well as some others.

Ninety-eight species and local races are recorded in this list, which is almost certainly very incomplete, as many widely distributed insects are missing from it.

*Papilio podalirius*, *P. machaon*. II., and in gardens; common.

*Thais polyxena*. I., II. Common.

*Aporia cratægi*. I., II., and in gardens; abundant.

*Pieris brassicæ*, *P. rapæ*, *P. napi*, *P. daphnidice*. I., II., III. Generally abundant.

*Euchloë cardamines*. II.

*Leptidia sinapis*. II., III. Common.

*Colias hyalæ*, *C. edusa*. I., II. Common.—*C. myrmidone*. II., III. Rather scarce.

*Gonepteryx rhamni*. II., III. Common.

*Thecla spini*. II. Rare.—*T. w-album*. III. Rare.—*T. ilicis*. II., III. Common.—*T. acaciæ*. II. Rather common.

*Callophrys rubi*. II. Rare.

*Zephyrus quercus*. II., III. Common.—*Z. betulæ*. Common.

*Chrysophanus thersamon*. I., II., III. Rather common in moist spots.—*C. rutilus* (*dispar*). I., III. Common. Cf. Ent. Rec. vol. xxi. p. 13, 1909.—*C. phlæas*. I., II., III. Common.—*C. dorilis*. II., III. Rather rare.

*Lycæna argiades*. I. II. Common.—*L. coretas*. II.—Var. *decolorata*. II.—*L. argus*, *L. argyrognomon*. I., II.—*L. baton*, *L. orion*. II. Rare.—*L. astrarche*. II.—*L. icarus*. I., II., III. Common.—*L. meleager*, *L. bellargus*. II.—*L. corydon*. II. Very rare!—*L. semiargus*, *L. cyllarus*. II.—*L. alcon*. II. Rare. Here the larva feeds on *Gentiana cruciata*.—*L. arion*. II., III. Rare.

*Cyaniris argiolus*. II. Common.

*Nemeobius lucina*. II., III. Common.

*Apatura iris*. III. Rare; only in the Réz Mountains.—*A. ilia*. I., II., III. Common. The larva on *Salix* and *Populus*.

*Neptis aceris*. II., III. Rather common.

- Pyrameis atalanta*, *P. cardui*. Generally common.  
*Vanessa antiopa*. I., II., III. Rather rare. — *V. io*, *V. urticae*. Generally common. — *V. polychloros*. I., II. Rather rare.  
*Polygonia l-album*. III. Very rare in the Réz Mountains. — *P. c-album*. I., II. Common.  
*Arachnia levana*. I., III. Rare.  
*Melitæa cinxia*. II. Rare. Larvæ on *Veronica spicata*. — *M. phæbe*. II. Rare. — *M. didyma*. I., II. Common. — *M. trivia*. II. Rare. — *M. athalia*. I., II., III. Common. — *M. aurelia*. II. Common. — *M. dictynna*. II. Rare.  
*Argynnis selene*, *A. dia*. I. Common. — *A. hecate*. II. Rare among *Spiræa filipendula*. — *A. daphne*. III. Rare in the Réz Mountains. — *A. latonia*. I., II., III. Common. — *A. aglaia*, III. — *A. adippe*. II., III. — *A. paphia*. III. Common. — *A. laodice*. III. Rare. Single examples occur all over the Réz Mountains, and in some of the woods at lower elevations, always in wet places. The butterflies are especially fond of the blossoms of *Eupatorium*. Cf. Entom. vol. xlii. pp. 49-54 and p. 258, 1909.  
*Melanargia galatea*. II.  
*Erebia æthiops*. III. Common. In the Réz Mountains only.  
*Satyrus circe*. III. Common. — *S. hermione*. II., III. Rare. — *S. semele*. II., III. — *S. dryas*. III.  
*Pararge egeria*, *P. megæra*. II. — *P. mæra*. II. Very rare.  
*Aphantopus hyperanthus*. II., III.  
*Epinephele jurtina*. I., II., III. Common. — *E. tithonus*. III. Very rare.  
*Cænonympha iphis*. I., II., III. — *C. arcania*. II., III. — *C. pamphilus*. Common everywhere.  
*Heteropterus morpheus*. III. Rare and disappearing.  
*Adopæa lineola*, *A. tharmus*. I., II.  
*Augiades comma*, *A. sylvanus*. I., II.  
*Charcharodus lavateræ*. II. Rare. — *C. alceæ*. I. Rare.  
*Hesperia sidæ*. II. Rare. The larva probably feeds here on *Potentilla recta*. Cf. Rovartani Lapok. vol. xv. p. 147, 1908. — *H. alveus*. II., III. — Var. *fritillum*. III. — *H. malvæ*. II., III.  
*Thanaos tages*. II. Common.

## CALLOPHRYS AVIS IN SOUTH FRANCE.

By GODFREY A. FOLJAMBE.

To those readers of the 'Entomologist' to whom the study of European Rhopalocera is an interest, the following notes concerning this as yet comparatively little-known butterfly may prove not unwelcome.

During a temporary respite from the rigours of an English spring, I found myself, towards Easter last, on the Mediterranean coast, in the neighbourhood of a spot reputed to be the haunt of *Callophrys avis*. An expedition thither on the first suitable day seemed the obvious duty of a collector to whom the



But before these days were over we had come upon *tiphon* elsewhere, and in at least one of its romantic haunts on the historic ground "between Bala and Festiniog." It was on July 2nd that we found the butterfly. Our route for some miles lay along the Maesmor Valley and by its babbling stream, with hedges on either side of the road decorated with wild roses. Turning to the left, we began the ascent to the Bala-Festiniog Road, finally reaching a height of some 1200 ft. above sea-level. The forest-belt of oak was now left below, the roses had disappeared, and were replaced by two forms of *Spiræa*—one with a profusion of pink flowers, the other white. Foxgloves of a deep red nestled in the hedge-banks, and suggested thoughts of *Eupithecia pulchellata*. On the mountain slopes were big yellow violas, differing from those on the mountains on the other side of the valley, which were blue.

We were now where the sounds of population failed, and our plan was to halt when likely bogs, clad in heather and cotton-grass, appeared on either side, leave the car in charge of our chauffeur, and search for the butterfly. The day was almost sunless and the search laborious, but at last we came upon a freshly emerged female, stiffening its wings on a grass-stem. The empty pupa-case, however, was not discovered.

We had thus the key to the situation; so, returning to the car, we soon covered the twenty miles that lay between us and home.

July 3rd was a better day, so, taking advantage of it, we paid a second visit to the spot, and netted altogether eighteen males, all in fine condition. On the 15th Mr. Kerr found the butterfly flying freely (both sexes), but much worn; and it was difficult to get half a dozen in really good condition.

Comparing the Welsh form\* with that of North Lancashire, and especially with the one at Delamere, the Welsh insect suffers in the comparison. The specimens caught showed a golden

\* I am greatly indebted to Mr. Arkle and Mr. Kerr for much valuable information on the subject of these welcome new-found Welsh *tiphon*. This I have incorporated in a monograph upon *Cænonympha tiphon*, Rott., shortly to appear in the 'Etudes de Lépidoptérologie Comparée,' published by M. Charles Oberthür, of Rennes. Mr. Arkle was good enough to send me three perfect male specimens on the day of their capture, and two at least will be figured in colour by M. J. Culot among the thirty-six selected for illustration from localities throughout the United Kingdom. The Merioneth *tiphon* is decidedly typical, though somewhat smaller than the run of examples from Northumberland, Yorkshire, and elsewhere (Buckell's middle form). It has apparently little relation with the *philoxenus* found in its at present nearest-known haunts in Shropshire, in Delamere Forest, and in the mosses of Lancashire (southern form). Mr. Walker's record in Denbighshire suggests that the connecting link between the marsh and the mountain *tiphon* hereabouts may yet be discovered in the intervening areas, some of which still retain land well adapted to the life-habits of the species.—H. R.-B.

tawny on the upper wing surfaces, common perhaps to all when fresh out, but it soon fades, probably owing to the cessation of respiration and consequent loss of oxygen. The most noticeable features in the comparison are the smallness of the spots and the broad antemarginal suffusion, ashy-grey on the under sides, which is more pronounced than on any other specimens I have seen.

Judged by the gradual darkening of greys and browns of the following forms of *tiphon* in my collection, as well as by the gradual increase in number, size, clearness, and development of the ocellated and other spots, I have arranged them as follows:—

(1) PERTSHIRE (= *laidion*, Bkh.). — Pale; spots few and small, indistinctly ocellated, sometimes absent from the upper wing surfaces, which are margined with whitish grey.

(2) MERIONETHSHIRE (= *tiphon*, Rott.). — Spots more numerous, larger, and usually clearly ocellated. Upper wing surfaces edged with ashy-grey.

(3) NORTH LANCASHIRE (= *philoxenus*, Esp.). — Spots still larger, and clearly ocellated. One specimen (a male) is sooty-brown.

(4) CHESHIRE, DELAMERE (= *philoxenus*, Esp.). — Darkest. Spots largest, and clearly ocellated, the whitish encircling rings on the lower wings (under sides) often touching each other. One male is very sooty-brown.

I have four specimens from this locality with the spots on both sides lanceolated. For reference purposes, some years ago, I proposed the varietal name of *lanceolatus* for this uncommon form.

The only other butterfly we saw was *C. pamphilus*. One specimen captured was unusually large. The experience of other collectors may not support my observation, but I have no recollection of seeing *pamphilus* on exactly the same ground as *tiphon*, whatever the character of the locality might be.

Chester: Dec. 23rd, 1912.

## EARLY AUGUST AMONG THE ALPS.

By F. A. OLDAKER, M.A., F.E.S.

I SPENT the first fortnight of August, 1912, among the Alps, and since the weather, during the first week at any rate, was good enough to enable me to capture nearly two hundred butterflies, a short account of the trip may be of interest.

I reached Lucerne in a deluge of rain about noon on August 2nd, and went by boat right through to Flüelen, seeing practically nothing all the way but an occasional blur of mountain through the mist. I had intended to start walking from Flüelen towards the St. Gotthard, but decided to take the train as far as Göschenen. When I arrived there it had partially cleared,

though it was still raining, but I walked over the Devil's Bridge and through Andermatt to Hospenthal that night, in order to get on my way betimes the next morning over the Pass. Fortunately, August 3rd was fine, though in the early morning it was dull and misty. But when I was well past the top of the Pass, and had negotiated several of the zigzags on the way down, the sun came out, and the rest of the day was brilliantly fine. I soon saw *Pontia callidice* flying very fast over difficult ground, but I managed to secure a male in very fine condition, and at the same altitude I took *Brenthis pales*, *Melitæa athalia*, including a nice banded form, and some good mountain forms of *Erebia goante*. The number of species multiplied as I descended towards Airolo, and among others I took or saw *Papilio machaon*, *Parnassius apollo* (very plentiful), *Aporia cratægi*, *Issoria lathonia*, *Argynnis aglaia* (swarming), *Pararge mæra* (much brighter than those I took in the Martigny-Chamonix district three years previously), *Cænonympha satyrion*, *Erebia pronoe*, *E. epiphron* var. *cassiope*, *E. melampus*, *E. pharte*, *E. tyndarus*, *Melanargia galatea*, *Chrysophanus virgaureæ* (including two fine females, one with the black spots on the upper wings developed into streaks and a tendency to streaks on the lower wings, and the other with similar markings on the lower wings, but the upper wings normal), *C. hippothoë*, *C. doris* var. *subalpina*, *Nomiades semiargus* (very common), *Polyommatus corydon* (swarming), and *P. pheretes*. Some of the grass slopes by the side of the road were literally alive with *P. apollo*, *A. aglaia*, *P. mæra*, *C. virgaureæ*, *N. semiargus*, and *P. corydon*. I walked on through Airolo, as far as Rodi-Fiesso Station, but by about 3.30 the butterflies were disappearing, and I caught nothing more worth noting. I then took the train to Bellinzona, where I stayed the night, and started off towards Magadino, on the north-east shore of Lake Maggiore, in the early morning of August 4th. This was also a brilliantly hot day, and by about 9 a.m. the butterflies began to appear.

One of the first I took was *Leptosia sinapis*, and on the grassy slopes along the roadside by the lake I saw *Pieris rapæ*, *Melitæa athalia*, *Nemeobius lucina*, *Epinephele tithonus*, *Erebia æthiops*, *Celastrina argiolus* var. *argyphontes*, *Polyommatus icarus*, and *Rusticus argyrognomon*. Having walked to Luino, I took the boat to Laveno en route for Milan. On the morning of Aug. 5th I left Milan early for Laveno, whence I went across the Lake to Pallanza. From there I walked *viâ* Fondo and Suna to Gravelona, Toce and Domo d'Ossola, and during the first half of the time it was rather uncomfortably hot. However, I soon got among the butterflies, for I was hardly out of Pallanza when I saw *Papilio machaon*, *Pyrameis atalanta*, and males of *Colias edusa*, flying at a great pace between the road and the Lake. *Rusticus argyrognomon* was plentiful on the road, and kept settling among the scanty herbage between the tram-lines. I soon came



to more open country, and was having a good time in a field of uncut hay by the roadside, when an irate peasant drove up in a diminutive cart and ordered me off, but not before I had netted a fine female *Colias edusa* and several males of *C. hyale*, as well as *Leptosia sinapis*, *Polyommatus baton*, *Carcharodus alceæ*, *Epinephele jurtina*, and a nice variety of *Cœnonympha pamphilus*, with a dark border and large apical spot on the upper wing. I then passed some extensive granite quarries, and here I took a lovely specimen of *Apatura ilia* var. *eos*, which kept settling on horse-droppings in the road just in front of me, and it was fully ten minutes before I succeeded in netting it. *Melitæa athalia* and *Rusticus argyrognomon* were very plentiful here, and *Polyommatus icarus* and *Chrysophanus phlæas* were also present in some numbers. At Domo d'Ossola I took the train to Iselle, where I slept the night, and walked over the Simplon to Brigue on Aug. 6th.

High up on the Pass I got *Erebia tyndarus*, *E. mnestra*, *E. gorge*, *E. æthiops*, and *E. euryale*, and between Simplon village and Bérisal *Pararge mæra*, *Polyommatus corydon*, *P. melon* (including a rare variety in which the first two spots of the hind wing are in a line with the others instead of being advanced), *Rusticus argyrognomon*, and *Pamphila comma* were plentiful. At Bérisal and just beyond it *Melitæa athalia* was very common, and I took *M. didyma*, *Brenthis pales* var. *arsilache*, *Cœnonympha satyrion*, *Erebia melampus*, and *Polyommatus damon*; further on towards Brigue, *Argynnis aglaia*, *Pararge mæra*, and *Pamphila comma* were very plentiful. About two miles from Brigue I came upon numbers of *Polyommatus damon* and *P. corydon* settled on the grass and flower-heads for the night, and I selected a few nice examples of both species. I arrived at Brigue about 6.15 p.m., having walked practically all the time since 7 a.m.

On the following day (Aug. 7th) I started off up the Rhone Valley towards Gletsch. It was misty and threatening rain, and by the time I had reached Fiesch a steady downpour had set in, so I took refuge in the Hôtel des Alpes, where I stayed about four hours. The result of this was that I only reached Ulrichen that night instead of Gletsch, as I had intended. It was very heavy going on the muddy road, and I arrived at the primitive little Hotel Glacier de Gries wet and tired, with, of course, no addition to my bag for that day. Aug. 8th promised better, and I started at 6.45 for Gletsch and the Grimsel. A thick mist obscured everything from just above Gletsch until I reached almost the top of the Pass, and it was extremely cold and unpleasant. But it was a new experience to me to see flowers peeping up through the snow, and from the top of the Pass to the Hospice it rapidly became warmer and the atmosphere clearer, till by the time I reached the Handegg Falls it was a brilliant afternoon, though I saw no butterflies except *Erebia melampus*. By way of Guttannen and Innertkirchen, I arrived



at Meiringen soon after six, having done about thirty miles. It was a glorious day's experience, in spite of being a failure entomologically. A tramp through Brienz to Interlaken and St. Beatenberg on the 9th yielded nothing but *Pararge mæra*, *Aphantopus hyperanthus*, and *Chrysophanus dorilis*, for, though it was fine, the sun only appeared at intervals; and on the following day, walking from St. Beatenberg to the shore of the lake at Beatenbucht, I only took *Erebia æthiops*, *Aphantopus hyperanthus*, *Epinephele jurtina*, *Pararge mæra*, *P. megæra*, and a worn specimen of *Thecla spini*. I also saw a fine male of *Callimorpha quadripunctaria* in the waiting-room by the landing-stage. Then I went by water to Thun, where, about 1 p.m., while waiting on the quay for the return boat, a male *Apatura iris* settled by a puddle on the road almost at my feet, but I could not get out my net in time. I crossed the lake to Spiez, and walked to Frutigen. It was fine, and the sun shone brightly till about 4 p.m., by which time, when passing through Aeschi, I had taken *Leptosia sinapis*, *Polyommatus icarus*, and *P. corydon*. During the rest of my tour the weather was very uncertain, and I took no more insects, but I carried out my programme in spite of the wet, and walked, on the 11th, to Lauterbrunnen, thence on the 12th *viâ* Wengern and the Wengern Alp, over the Little Scheidegg and Männlichen to Grindelwald; on the following day over the Great Scheidegg, through a perfect deluge of rain and sleet, to Meiringen, whence I started, on the 14th, *viâ* the Brunig Pass, Lungern, and Giswil to Sarnen and Lucerne.

Between Aug. 2nd and 14th I walked about two hundred and sixty miles, every bit of the country being new to me, and I added considerably to my collection. I imagine that the ground between St. Gothard and Airolo, and that on both shores of Lago Maggiore, would well repay a prolonged stay, for, apart from the new species to be taken there, the variation among such insects as *Pararge mæra* and *Chrysophanus virgaureæ* is very interesting.

I cannot conclude this short article without recording my grateful thanks to Dr. Chapman, who very kindly identified several of the specimens about which I was doubtful.

The Red House, Haslemere: Dec. 30th, 1912.

## FRIENDS AND FOES OF THE CONIFERÆ.

By J. W. H. HARRISON, B.Sc.

(Concluded from p. 54.)

SUCH a series is readily made up, and the following is offered as a reasonable scheme, as all the spiders in it can be obtained anywhere, with the exception of *Bolyphantes expunctus*, which, however, can be obtained in abundance in certain districts, as has been explained.

SPECIES	HABITS	HABITAT	WHEN ADULT
<i>Salticus cingulatus</i> ..	Hunting spider	Bark	May–Sept.
<i>Cryphocca silvicola</i> ..	—	Bark, needles, dead leaves	All the year
<i>Amaurobius fenestralis</i> ..	Spins a floccose web	Under bark	do.
<i>Theridion varians</i> ..	Spins a web	In trees and bushes	Summer
<i>T. sisyphium</i> .. ..	do.	do.	do.
<i>T. pallens</i> .. ..	do.	do.	March–June
<i>Leptyphantes obscurus</i> ..	Spins slight web	Under bark	May–July
<i>Linyphia montana</i> ..	Spins a web	In trees and shrubs	May and June
<i>L. triangularis</i> .. ..	do.	Low down on shrubs	August–Sept.
<i>L. peltata</i> .. ..	do.	Higher in trees	May–August
<i>L. insignis</i> .. ..	Spins a snare	On branches	August–Oct.
<i>Drapetisca socialis</i> ..	Hunts over bark	On trunk	August
<i>Bolyphantes expunctus</i> ..	Hunts	On branches	August–May
<i>Meta segmentata</i> .. ..	Spins a geometric web	Amongst foliage	All the year
<i>Epeira diademata</i> ..	do.	do.	Autumn
<i>E. cucurbitina</i> .. ..	do.	do.	do.
<i>E. umbratica</i> .. ..	Spins geometric web ; lives under bark	Lower branches	do.
<i>Zilla 10-notata</i> .. ..	Lives in colonies ; spins a snare	Amongst conifer needles	August–April
All Lycosidæ and Drassidæ	Hunting spiders	Generally on the ground	Summer

The two Phalangids, *Oligolophus morio* and *O. alpinus*, would be of great use too, as they can be beaten out of conifers in many woods, in great abundance.

The above list does not pretend to be exhaustive, but all the spiders in it, except *Bolyphantes* and the Drassids and Lycosids, could be collected in large numbers from furze bushes and various shrubs by any intelligent woodman, and liberated in areas infested by *Coleophora laricella* to a dangerous extent. The Lycosids and Drassids, of course, would have to be captured on the ground—a task giving but little trouble. To give the spiders a fair chance to deal with the pests, it would be necessary to discourage their spinning snares too close to the ground ; this could be done by keeping the wood clear of rubbish of all kinds,

and this would destroy, incidentally, the breeding grounds of the Scolytid beetles such as *Tomicus laricis*, *Hylurgus piniperda*, &c. Further, it would be as well to limit the growth of heather (unless required for game purposes) for the same reason. None of the above spiders and Phalangids, except the Drassids and Lycosids, are averse to living in trees, for I have beaten nearly all from conifers, and they would form an effective patrol for the woods when *C. laricella* was out as an imago, and, incidentally, in the case of the small forms, many Aphids would be captured, and in the same way the larger forms would secure many beetles and sawflies.

In all of the woods examined, beetles, either weevils or bark beetles, were but few in numbers, and have never at any time caused appreciable damage. Possibly the commonest beetles in the woods were the Coccinellids mentioned above, and *Rhagium bifasciatum*. As was said, the ladybirds are friendly insects, and in all probability *Rhagium* should be placed in the same category, as its larva feeds on, and demolishes, decaying stumps which otherwise would be lurking places for destructive insects of all kinds.

It was said that *Phigalia pedaria* (the Brindled Beauty Moth) was in sufficient numbers to affect the foliage of the larch in the larval condition. It can never become such a pest as *C. laricella*, for it emerges at a time when insect food is scarce, and owls make short work of it, as the huge number of wings lying about in March and April shows. It is only the immense quantity of eggs laid by the wingless females that keeps its numbers up.

## NEW BUTTERFLIES FROM NIAS.

By PERCY I. LATHY, F.Z.S., F.E.S.\*

### *Hiposcritia nupta*.

*Hiposcritia lalage nupta*, Fruhs. Ent. Nachr. Jahrgang, xxiii. n. 4, p. 63 (1897).

*Catophaga melania nupta*, Fruhs. Iris p. 287 (1902).

♀. Upper side. Fore wing with costa, apical third and outer margin blackish, three submarginal white spots: hind wing white, outer margin blackish, enclosing three white spots on inner edge.

Under side. Fore wing white, apex yellowish, a subapical blackish band containing a white spot between upper and middle median nervules; hind wing uniform yellowish.

This appears to be a rare species. There are ten males and the female here described, which is, I believe, unique, in Coll. Adams.

\* The types of all the species described in this paper are in the Adams Collection, which is now at the Natural History Museum, South Kensington.

*Neptis kahaja*, sp. nov.

*Neptis ilira*, Kheil, Rhop. Ins. Nias, p. 24, v. iii. f. 14 (1884).

♂. Upper side. Fore wing blackish brown; cell, inner margin, streaks along nervules, an irregular postdiscal line, and two submarginal lines fuliginous, a whitish streak beyond cell, and four discal triangular white patches. Hind wing blackish brown, costal area widely shining grey, four fuliginous bands crossing wing, the first and third from base being wider.

Under side. Fore wing pale brown, inner margin widely shining grey, cell and interspaces clouded with fuscous, a shining golden patch at base of median nervules, an irregular postdiscal and two submarginal fuscous lines, the space between whitish, white markings as above but with a lilacine tint; a long whitish streak within cell. Hind wing pale brown slightly clouded with fuscous, three fuscous bands crossing wing beyond cell and a submarginal fuscous line, two whitish bands, one across centre of cell, the other postdiscal.

♀. Upper side. Fore wing similar to male, but markings paler and two additional white patches. Hind wing as in male, but without costal shining area and bands paler and more conspicuous.

Under side. Fore wing wants shining area and all markings of both wings larger and paler.

From *N. lasara*, Fruhs., this species may be distinguished by fringes having no white, and from *N. ilira*, Kheil, by the greater extent of costal shining area of hind wing in male, and greater extent of white markings.

*Neptis charonides*, sp. nov.

♂. Upper side. Fore wing black with the following white markings: a long narrow streak within and triangular patch at end of cell, two preapical patches with minute dash above them, a patch above and a larger one below middle median nervule, a point on inner margin, a submarginal series of spots. Hind wing black, pale on costa, an antediscal white band, a postdiscal series of white spots and a submarginal pale brown line.

Under side. Fore wing dark brown paler on inner margin, white markings as above but cellular streak shorter, submarginal spots larger, and beyond them a fine white line. Hind wing dark brown, white markings as above but spots larger, a discal pale brown line, submarginal line whitish, base of costa whitish.

♀. Similar to male in both wings above and below, but somewhat larger, paler, and the white markings a little more extended.

A race of *N. charon*, Butl. It may be separated from the allied form from the adjacent islands by the much narrower white markings.

*Pantoporia kannegieteri*, sp. nov.

*Athyma kresna*, Kheil (nec Moore, 1858), Rhop. Ins. Nias, p. 25 (1884).

♂. Upper side. Fore wing blackish with following white markings: a basal streak within cell, two spots beyond this streak, a



large triangular patch at end of cell, two preapical spots, of which the lower is the larger, below these a minute point, a large round spot between middle and lower median nervules, a triangular patch above middle of submedian nervule, and an oblong patch below it; two obscure submarginal waved pale brown lines, of which the inner is strongly incurved on upper median nervule. Hind wing blackish, an antediscal white band, broken at subcostal nervule, a postdiscal series of white spots, a submarginal pale brown line.

Under side. Fore wing ochreous brown, white markings as above, spaces between them blotched with dark brown, submarginal lines whitish. Hind wing ochreous brown, white markings as above, submarginal line whitish, a discal row of dark brown spots.

♀. Upper side. Fore wing similar to male, but slightly paler, white markings larger and inner submarginal line white. Hind wing similar to male but paler and white markings larger.

Under side. Both wings similar to male but paler and white markings larger.

This is a race of *P. kresna*, Moore, from which it appears to be constantly different in the paler ground colour above and below, and the much more restricted white markings.

#### *Euthalia mitschkei*, sp. nov.

♂. Upper side. Fore wing dark olive brown with the following blackish markings: a line near base, two across middle of, and two at end of, cell, a bar between median and submedian nervules, and a small circular line below base of lower median nervule, two narrow lunular bands, one discal, the other submarginal—this inclined to be sagittate. Hind wing shining dark olive brown, paler on costa, a double black bar at end of cell with a blackish spot below it; lunular bands as in fore wing.

Under side. Fore wing pale yellowish brown, darker towards anal angle; the following black markings: a spot near base, two lines across middle of, and two at end of, cell, a minute spot below base of lower median nervule and a series of submarginal spots, an obscure row of discal brown lunules. Hind wing pale yellowish brown, with following black markings: cellular and submarginal as in fore wing, two oval marks above cell, of which the upper is the larger, discal brown markings more conspicuous than in fore wings.

This is the Nias representative of *Euthalia kanda*, Moore, from which it differs in the paler ground colour and more conspicuous markings of the upper surface and the much paler ground colour of the under side; it appears to be very rare. It seems to be very remarkable that *Euthalia monima*, Fabr., does not appear to occur in Nias; this is such a common species in all the adjacent islands that one would certainly expect to find it.

#### *Euthalia adinda*, sp. nov.

♀. Upper side. Fore wing copper-brown with the following white markings: an irregular patch at end of cell, three patches

beyond cell, of which the upper is minute. beyond these a curved series of four spots, two large patches between upper and lower median nervules, and below these two smaller patches, a yellowish streak below these; the white markings above median nervule more or less edged with blackish, two black bars in basal half of cell with a black spot below each outside cell, a submarginal row of blackish spots. Hind wing copper-brown with the following black markings: a double bar at end of cell, with minute spot above it, two rows of discal lunules, the first only reaching half way across wing, a submarginal row of spots, of which the three upper ones and that at the anal angle are outwardly widely bordered with scarlet, three brownish white discal patches from costa to lower discocellular nervule; a coppery green patch at anal angle.

Under side. Fore wing yellowish brown paler at anal angle, white markings as above, two black bars at end of, and two crossing middle of, cell, each scarlet patches, a black spot near base of cell, and another below base of lower median nervule: submarginal black markings as above. Hind wing yellowish brown, inner margin and anal angle greenish, discal and submarginal markings as above but smaller, base of costa scarlet, a black bar on precostal nervule: cellular black and scarlet markings as in fore wing but smaller, two irregular twin black markings above cell, each enclosing a scarlet spot, a black line between discocellulars.

This species belongs to the *lubentina* group, but may be distinguished by the discal patches of hind wing above, being brownish white instead of red. It is an exceedingly rare species, the female here described being the only specimen I know.

(To be continued.)

## A MONTH'S COLLECTING IN HUNGARY.

By GERARD H. GURNEY, F.E.S.

(Continued from p. 57.)

SWARMS of *C. iphis* in perfect condition fluttered amongst the grass, and *C. pamphilus* was nearly as plentiful. Hundreds of gloriously fresh *Issoria lathonia* flew amongst the juniper bushes, both sexes being equally common: a few odd specimens of *M. trivia* occurred at the beginning of the wood, but it is a local butterfly, and not until we had penetrated for nearly a mile into the middle of the forest did we find the headquarters of this pretty little species, and then in several places it was very common, and evidently only very recently emerged. *Trivia* is a somewhat difficult insect to catch on the wing, its flight is very quick and rather erratic, but no sooner had we reached the spot where it was common than the sun became overcast by clouds, and the butterflies at once ceased flying, and settled down in twos and threes on grasses and flower-heads, and I was then able to take easily a nice series of perfect specimens. I was told

that Csepel was a very good locality for *P. orion*, but apparently it was not yet out here, as we did not see a sign of it, though, curiously enough, the following day I took four or five specimens on the Schwabenburg, a good thousand feet higher elevation!

Another visit to the Budafok marshes resulted in a dozen more perfect *C. thersamon*, which was quite common. Some of the males were very fine, with a beautiful purple suffusion on the upper side of the lower wings; but I got little else that was fresh except two rather worn male *Everes argiades* var. *poly-sperchon*, and a long series of *C. iphis*, which was very abundant and showed considerable variation in the spotting on the under side of the hind wings.

On the Schwabenburg on the 24th I found *P. mnemosyne* males common in a meadow by the station; here also were a few fresh *Hesperia carthami*. In the sheltered glades *P. orbifer* was now plentiful, and a few rather small *P. orion* var. *ornata* were secured. Here and there were the two "swallowtails," while *I. lathonia*, *M. phæbe*, *Pararge megæra*, one very light-coloured *P. egeria*, a few fresh *P. rapæ*, which were quite ordinary, and several *N. cyllarus* and *P. icarus* males make up the tale.

On May 27th I left Budapest for Herkulesbad, nearly three hundred miles further south. Owing to the heavy rains, large floods had risen, and in consequence of a bridge over a swollen river giving way, my train was detained at Temesvár a good many hours, and did not arrive at Herkulesbad until late on the evening of the 28th. This washing away of bridges is apparently a somewhat common occurrence in Hungary; I believe one or two other entomologists have been detained at Temesvár on previous occasions from the same cause.

Herkulesbad is a most delightful place, with a very comfortable hotel. I was told the weather had been extremely wet for the past fortnight, and certainly the amount of water in the Czerna, and the amount of mud on the road up the gorge, looked as if there had been a lot of rain. However, the first three days I was there were very fine and hot, though after that the weather again broke up, and I had to put up with several *dies non*; still, on the whole, I had a very successful week, and, in spite of weather, the more I saw of the place the more I liked it.

The butterfly of which I was most anxious to secure a series was *Neptis aceris*, which is a local species, never very easy to obtain. It is found, however, commonly at Herkulesbad, and I had not gone very far up the Czerna gorge on the morning of the 29th before I had netted my first, but it was rather a torn example, and I was very glad when I took others and soon found that I need only keep the best specimens, as it turned out to be quite common. I saw *N. aceris* nowhere else except in the



gorge, where I took a beautiful series of perfect specimens, though many were caught only to be released again, owing to their being chipped or torn, as this species very quickly becomes broken and ragged, partly, no doubt, owing to their habit of continually flying in and amongst the leaves and foliage of the trees and shrubs. I took most of my series in the afternoon on the way back to Herkulesbad. In the morning they seemed to be much more lively, not settling on the road or low down, but generally on the top twigs or leaves of a tree, and if disturbed flying rather quickly up the hillside until they were lost in the wood; but about three o'clock they would come down and fly gently up and down a sunny glade or along the side of the stone wall which borders the road for some distance, often stopping and lingering at some spot where the sun's rays came through the leaves overhead, as though loth to leave it; or else sitting on the road itself with outspread wings, when they were easy enough to catch. They varied a good deal in size; some of the males are very small, but amongst the large number netted and examined, no aberrations of any sort were observed—all were absolutely typical.

On the whole butterflies were not nearly so plentiful as I had expected; whether this was due to the weather, or to a late season, or whether my anticipations had led me to hope for too much, I do not know; but I certainly did not meet with anything like all the species I had anticipated. Certainly one cannot complain of the lack of *E. cardamines* and *L. sinapis*, as almost everywhere these two species were abundant; the latter large with well-marked under sides. *N. tages* also was in very great numbers along the road up the gorge; here, too, *P. orion* was beginning to come out, and before I left had become fairly common, though it was local; most of my specimens are var. *ornata*, but a few tend to var. *nigra*.

About a couple of miles up the gorge the valley widens out, the mountainous sides become much less steep, and delightful open marshy glades and meadows break into the thick woods; here butterflies were rather more numerous. *Everes argiades* was quite common and very large; equally common, but rather more local, was *E. coretas* ab. *decolorata*. Both these species were flying together in damp spots amongst the lush grass which grew round the little streams and tiny bogs. Here, too, *N. cyllarus* was almost plentiful, splendid large examples of both sexes. They generally have very little spotting on the under side of the upper wings. One or two fresh *Callophrys rubi* were also netted in the same place. Some three miles up the valley there is a large meadow on the right of the road, here fresh *P. mnemosyne* were plentiful, and two days later I found another locality for this species nearer Herkulesbad, where both sexes were flying up and down in some numbers. It is rather a fine



form, larger than my Swiss specimens, and darker than those I have from near Digne. On the aforesaid meadow were a few worn *Brenthis euphrosyne*, some fresh *A. cratægi*, with *G. rhamni*, *P. icarus*, *C. hyale*, *I. lathonia*, *P. mæra*, and *P. egeria*—all common.

*Pieris napi* was a very abundant species nearly everywhere, but especially on the way up the Domogled. All the examples I took were of the first brood; the second brood, which is var. *napeæ*, had not appeared before I left. *Pieris manni* was also common. It is perfectly distinct from the other "whites" at Herkulesbad, both in its flight and in its habits. It was generally to be found flying with a very *Sinapis*-like flight along the edge of the wood, threading its way in and out of the bushes; it did not often come down to the level of the road, and is entirely a woodland species. Larvæ were found on a tall white crucifer which grew right underneath the bushes in the wood.

On the Coronini meadows, which are on the right bank of the river below the town, on June 2nd I found several species which I had not seen before. A fresh brood of *Melitæa didyma* was common, rather small, but very red and with bold black markings. Quite typical *Epinephele janira* were just emerging, and I picked half a dozen fresh *Nomiades semiargus*. The flower-covered banks of a small stream were alive with butterflies. Some rather worn *R. argus* (*ægon*) were netted and released; brilliantly fresh *N. cyllarus* (males) sat on the leaves of knapweed, with equally large *P. icarus*, while nicely marked though rather small *M. phœbe* were common, and a single *Euvanesa antiopa*, the only specimen I saw at Herkulesbad, sailed round the willow trees planted by the edge of the stream. Climbing higher to where the wood joins the meadows, I netted two perfect *N. aceris*, but did not see much else, beyond a few fresh *Zygæna filipendulæ*.

(To be continued.)

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## BUTTERFLY-HUNTING IN THE BALKANS.

By A. E. GIBBS, F.L.S.

I SPENT a few weeks in the summer of 1912 in the Western Balkans, visiting Dalmatia, Montenegro, Herzegovina, and Bosnia. Although the season there, as elsewhere, was a disappointing one, and I did not see several species whose acquaintance I hoped to make, and which are known to occur in these countries, yet I obtained a fair number of interesting butterflies, and an account of the journey may be worth writing. Having crossed Europe to Trieste I went by boat down the Dalmatian coast to Cattaro, from which port I travelled over

the Black Mountain into Montenegro, subsequently returning to the sea and proceeding to Gravosa, whence I was able to get on by railway to Herzegovina and Bosnia. I shall relate my experiences in the different countries visited, devoting a short chapter to each.

#### DALMATIA.

It is a far cry from my Hertfordshire home at St. Albans to Spalato, the charmingly situated Dalmatian seaport, some two hundred miles down the eastern coast of the Adriatic, but there is a connecting link between the two places which makes Spalato a particularly interesting spot to me. It was under the Diocletian persecution that the martyrdom of St. Alban took place. The great emperor was a native of what is now Dalmatia, and when, growing old, the cares of government became too heavy for him, he did what a good many Roman emperors were unable to accomplish—he laid them down without also laying down his life, and, retiring to his native land, built himself a splendid palace. When the Avars overran the country and destroyed the Roman town of Salona, the inhabitants took refuge inside the strong walls of Diocletian's great house, actually building their new city in its spacious enclosures. So, on June 2nd, as I strolled up the slopes of Monte Marjan, I thought of all that the decree of the mighty Dalmatian emperor of Rome had meant for British Christianity, and remembered that the very existence of my native city might be directly attributed to it. But I was awakened from dreams of the past by a small white butterfly which fluttered across the path. A turn of the net and my first specimen of *Pieris ergane* was secured, the pioneer of a considerable series captured during the Balkan journey. The insect which before all others I was especially on the lookout for was *Melanargia larissa* var. *herta*, Hb., and seeing a grassy place which appeared to be a likely spot, I climbed the wall of the enclosure and succeeded in beating out and securing a specimen of this local Satyrid. *Herta* is the variety of *larissa* which occurs in the Western Balkans, and is distinguished from the nymotypical form in having the disc of the wings white. Returning to the path I took two specimens of *Thecla spini*, which is a rather abundant insect in this part of the world. On the flower-heads the commonest of our Palearctic Syntomids, *Syntomis phegea*, was disporting itself, while *Cænonympha pamphilus*, which could not be distinguished from the British form, flew by the wayside. When I reached the top of the hill I found an old and familiar friend, *Vanessa cardui*, careering boldly about as is its wont, but while I sat on a wall watching its gambols with one eye, and with the other the crowd of young Dalmatians swinging and playing in the grounds of the restaurant, the gathering clouds warned me

to be moving, and before I could get back to the town rain began to fall. The next morning, however, was fine and bright, and there appeared to be every prospect of a good butterfly day, so I resolved to take the ten o'clock train to a place called Clissa, about an hour's ride inland. I booked second class, and my travelling companions were a young couple with a baby. The mother insisted, despite the heat, on having the windows closed for fear baby should catch cold, while the father spent his time in entomological pursuits, chasing and killing the numerous flies which showed a strong desire to settle on the sleeping infant! I made up my mind to escape at the first opportunity, so at a wayside halt I changed into an airy third class carriage with an open platform in front, from which I saw var. *herta* flying abundantly among the grass and herbage on the hillside. I think my journey would have yielded better entomological results if I had left the train at one of these little stations. At Clissa there is a picturesque castle-crowned hill, where a few soldiers are stationed, and as I entered the gateway to explore the old fortifications, I noticed *Papilio podalirius* flying round the young trees; but they were ancient specimens and in very worn condition, so I let most of those I captured go. A soldier had been watching me, and when I put down the net to take a snapshot from the ramparts, he took possession of it and frantically, but not very successfully, chased every *Papilio* that appeared, bringing to me in triumph the poor, battered, tailless creatures which he succeeded in catching. When I got the net back I started off down the hill to try to reach the source of the river Jeder, which issues, as so many of the Balkan rivers do, in a great stream from the base of a limestone cliff. It was a hot walk of two or three miles, with nothing to be had until I came to a hillside where I got eight or nine *M. var. herta*, a nice series of *Polyommatus escheri* in prime condition, and one *P. orion* decidedly the worse for wear. I have said that nothing was to be had *en route*, but I had forgotten a stern chase after a very vigorous specimen of *Polygonia egea*, which I ultimately caught on a bramble bush; but I caught the bramble too, and, before I could disentangle the net, *egea* succeeded in getting away. But I made up for the disappointment as I netted several specimens later in the day, and during my visit to the Balkans I got a good many of them. After a picnic lunch in a green and shady corner of the valley by the source of the river, with a flowery spot near by, where I took *Pontia daplidice* and several of the common *Lycænids*, I walked back to Spalato, where I posted my captures—fifty-six in number—home to be set.

The next day I went on by sea to Ragusa, an ancient and most interesting town. In the afternoon of my arrival I took passage on a small steamer which was advertised to run to the island of Lacroma, where *Charaxes jasius* is said to fly, and



thence to the source of the river Ombla. It was too rough to land on the island, so we steamed round it, and running for a few miles up the coast, the little boat tumbling about a good deal in a very choppy sea, we entered the estuary of the river, where we found smoother water. We steamed up it as far as the boat could be taken, landing in front of a little inn, five minutes' walk from a mighty cliff, where the Ombla issues from the bowels of the earth a full-grown river. During the half-hour or so we spent here I took a few *P. ergane* and other insects. It seemed a good spot for collecting, so I resolved to revisit it the next day, when I decided that I would try to reach it by climbing over the mountain behind Ragusa, instead of by following the coast line. It was a very rough scramble to the top of the hill, for I failed to find the path, the nature of the ground making butterfly-hunting quite impossible, but when once the summit was gained I was rewarded by a beautiful view of the coast. In a little hollow *Agriades ithetis* was flying in considerable numbers and good condition. Having crossed the plateau I struck the railway from Gravosa, which had climbed high up on the side of a valley. A path zigzagged from the little station down to the village. By the side of it I got *Melitæa cinxia* and *M. trivia* in single specimens, *M. didyma*, *Thecla spini*, and *T. ilicis*.

One of the most interesting captures of the day was a Hesperid, which at the time I thought was *Pamphila nostradamus*, but which I now believe to be *P. lefebvreii*. Two males, both rather worn, were taken. In vol. iv. of 'Lépidopterologie Comparée,' M. Oberthür sets out at length the distinguishing features of these two species, and on Plate lxiv. in vol. v. there are excellent figures of upper and under sides of both sexes, drawn from specimens taken by Signor Querci at Formia, in the Italian province of Caserta. I have a good series of *P. lefebvreii* from the same place, and comparing these two specimens both with M. Oberthür's figures and with my Italian insects I think that the Dalmatian specimens must be assigned to Rambur's *lefebvreii*, notwithstanding the fact that M. Oberthür gives Dalmatia as a locality for *P. nostradamus*. At the little inn by the landing-stage I made an unsatisfactory lunch of raw ham and hard-boiled eggs, with coarse bread hot from the oven, washed down by a bottle of Giesshubler water and the wine of the country. Then I sought the hillside where on the previous day I had found *P. ergane*. The mountain was steep and the sun overpowering, so I had to remain under the shadow of a small tree and capture the few specimens which came my way. On the other side of the river the ground was a little less precipitous and there was more shade, so I made my way thither and took several *P. egea*, a poor *L. camilla*, and things of lesser note, but was also fortunate enough to secure another specimen



of *M. var. herta*. But the Ombla valley was like an oven, and I was glad to find a man with a conveyance, and I engaged him to drive me to Gravosa, whence the tramway took me back to the comfortable Hôtel Impérial at Ragusa. This brought to an end my brief entomological experiences in Dalmatia, for the plans I made to return later on for more *M. var. herta* were not carried out.

(To be continued.)

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## AN UNRECORDED APPLE SAWFLY IN BRITAIN (*LYGÆONEMATUS MÆSTUS*, ZADDACH).

BY FRED V. THEOBALD, M.A., F.E.S., Hon. F.R.H.S., &c.

THE larvæ of *Lygæonematus mæstus*, Zaddach, were sent me in 1911 and 1912 from two places in Hampshire (Steep and Froxfield), and from Berkshire (Mortimer). In all three cases they were found feeding on apple foliage. I also found a small colony on a "Worcester Pearman" at Wye in 1907, but was not then successful in rearing the insect.

The larvæ were sent me from Steep by Mr. T. E. Crompton, who found them in an orchard on June 5th, 1911, and on June 10th he sent me another batch found in an orchard at Froxfield, which were considerably smaller than those first sent. At Steep only a single branch of one tree was attacked and completely defoliated. At Froxfield they were much more plentiful, and were stripping the trees in typical sawfly manner.

The first ones pupated on June 13th, and the last on July 22nd. Some of them pupated in the soil of the breeding-jars, others on the surface of the soil, and several amongst the damaged foliage. Those in and on the soil covered the dull yellowish silk of their cocoons with fine particles of earth; those on the foliage had a thick cocoon of a pale, dull yellowish silk. The adults hatched out from April 20th to May 5th in 1912.

The colony from Mortimer, twenty in number, were found on a "Mother" apple, and were sent me by Mr. J. D. Lake on June 14th, 1912. These have pupated entirely amongst the foliage, making similar cocoons to those that pupated amongst the leaves in the previous year. The larvæ are very marked in appearance. The adult larva is apple-green, with a small, somewhat irregular, black spot on each side of the first four segments, and a large round black spot on each side of the next seven segments, numerous small black specks on the first four segments, and some on the sides of the others. Head green, with black eyes. Legs green. Length, 12 to 12.5 mm. A few specimens showed a more yellow tinge. Those under observa-

tion fed freely on the leaves, mainly eating them from the edge inwards, but now and then they devoured holes in the leaves. The adult is shiny black, with paler incisions on the venter; the legs pale, and also the base of the wings.

The insects were very kindly identified for me by the Rev. F. D. Morice, who writes me that *L. mæstus* of Zaddach is the same as *L. brevicornis*, Th. (1862) (non Cameron).

## NOTES AND OBSERVATIONS.

SOME ABERRATIONS OF BRITISH LEPIDOPTERA: *EUCHLOE CARDAMINES*.—Thanks to the photograph on page 28, *antea*, I am able to identify the albinistic aberration of *cardamines*, taken at Cock Clarks, Essex, as ab. *lasthenia*, Millière (Ann. Soc. Linn. Lyon, 1860, 3me livr. pl. 10, figs. 1 and 2). Millière figures a male. Mr. L. C. Hocking also figures a male. I have in my collection a female *lasthenia* taken in the environs of Sedan, Department of Ardennes. The example figured by Millière was captured at Digne, Basses-Alpes, by Donzel. I think it may be interesting to publish this information in the 'Entomologist.'—CHARLES OBERTHÜR, Rennes, Ille-et-Vilaine, France, February 5th, 1913.

The form figured by Mr. Hocking, and identified by M. Oberthür as ab. *lasthenia*, Millière, is included in the account of *E. cardamines* in Tutt's 'British Butterflies,' 1896, p. 245. Millière's description is as follows: "Larger than the type. The front wings and the hind wings appear to be more elongate, and less rounded than those of the type. The insect, in fact, seems to me to present an entirely different facies to that of the several male and female *cardamines* under my eyes; so much so that this butterfly might well be a distinct species. . . . The apical orange blotch, which is a little less vivid than in ordinary *cardamines*, occupies the same position, but the border of the apex is entirely without black; also the discoidal spot. In lieu of the characteristic spot and the black border broken with white, absolutely nothing is visible except the milky ground colour. The basal area of all four wings is quite white, and the under side markings, which in male *cardamines* always show through more or less above, are indistinguishable. The hind wings are also remarkable. The green under side spots of the type are replaced by spots of a very faint greenish yellow, arranged almost in the same way as in ordinary *cardamines*. Antennæ white. The plumules of the frontal tuft (toupet) pure white. Abdomen rather slender and long, white, as well as the legs." Millière, in fact, seems to have thought that, if not a distinct species, *lasthenia* might prove to be a hybrid with *sinapis*.

FURTHER NOTES ON HESPERIID CLASSIFICATION.—In the paper by me, concluded at page 28, I did not make it sufficiently clear that, of the Swiss authorities cited, I am indebted to Dr. J. L. Reverdin alone for the many and minute distinguishing characters of the Hesperiiids under review. Also that Plate iii. was originally designed and

prepared by him for fasc. 3, vol. ii. of the 'Bulletin de la Société lépidoptérologique de Genève,' of which publication Dr. Blachier is editor, and by whose and Dr. Reverdin's kind permission I was permitted to reproduce it in the 'Entomologist.' Dr. Blachier himself did not collaborate with Dr. Reverdin in the authorship of these valuable articles; nor did M. Rehfsous, and his bionomic observations are supplementary to Dr. Reverdin's own studies of the wing characters, &c., of the several species.—H. ROWLAND-BROWN.

FURTHER NOTES ON *TAPINOSTOLA CONCOLOR*.—Further to my notes (Entom. vol. xlv. p. 256) on the ovipositing of the above species. The ova referred to were laid June 23rd, 1912, and the bulk of them were hatched by 8 a.m. on July 10th following, the dark heads of the larvæ showing through the envelopes of the ova some twelve hours before emergence. A few larvæ were very actively crawling about all over the boxes in which they were confined, but the majority of them were secreted in the folds of the withered leaves on which the ova had been deposited; the empty egg shells did not appear to have been utilised as food. The young larvæ, immediately after emergence, measured about  $\frac{3}{32}$  in. in length, their colour being yellowish white; head and plate brown, black above the anal flap; when disturbed they became exceedingly active, and dropped when touched with a fine camel hair. The larvæ, to the number of forty, were placed in three separate glass tubes, each tube 4 in. long by  $\frac{3}{4}$  in. diameter (about equal numbers of larvæ to each tube), and in each tube were placed two 3-inch lengths of *Dactylis glomerata*, two lengths of reed tips, and two lengths of *Calamagrostis epigeios*. After introducing the larvæ to the tubes they were secured by closing the mouth of each tube with a layer of clean blotting-paper under a piece of muslin, both being held in place by a rubber band round the tube. The three tubes were then put in a glass jar, and placed in a shady corner of the garden; visited thirty-five minutes later, all the larvæ had disappeared from view. No perforations were revealed by a cursory examination, but a closer scrutiny showed that most of the larvæ were ensconced between the stems and leaf sheaths of *C. epigeios*, several having selected *D. glomerata* and one or two reed. Two perforations could be seen in the stems of *C. epigeios*, and one in *D. glomerata*, but none in the reeds, and these were possibly used merely as temporary places of concealment. The covers of the tubes containing the larvæ were then again tied down and left undisturbed until the evening. At 9.30 p.m. they were again visited with a lamp, and several larvæ were seen to be crawling about the tubes, possibly those who had not in the first instance selected *C. epigeios*, and who now found the stems already tenanted. Transparent patches were showing on the stems of *C. epigeios* and *D. glomerata*, where the green matter had been eaten away, showing that feeding had commenced, but so far as could be ascertained the reed tips had not been touched. Frass could be seen protruding from several of the perforations in the *epigeios* and *glomerata*.

On the following days (July 11th and 12th) the larvæ remained concealed by day, but when it became dusk several were always to be



seen crawling about the tubes. Two or three stems were gently opened, and larvæ found lying extended within. On the evening of July 13th the stems of *epigeios* and *glomerata* appeared to be almost reduced to shells, whilst the succulent portion of the reeds had also been attacked, and the larvæ in the tubes were crawling about in all directions, the tract of food within the larvæ showing up very distinctly as dark lines through the transparent skins.

On the morning of July 14th all the stems and *débris* in the three tubes were carefully gone through, and the larvæ transferred to a clean empty tube. Thirty of the larvæ were then turned out one by one on to a plant of *C. epigeios*, which had been planted for them in a shady corner of the garden, in a large wooden box measuring 3 ft. × 18 in. × 15 in. deep, sunk into the ground to within 3 in. of the top edges. The remaining ten larvæ were kept in the tube for further observation, and supplied with fresh food. The thirty released larvæ, when placed on the growing plant of *epigeios* (about 9 a.m.), immediately began to crawl down the stems, and many of them disappeared from sight behind the sheaths, whilst a few, when they had travelled to within 2 or 3 inches from the base of the stems, commenced to bore into them. By 9.30 a.m. one of the larvæ engaged in boring operations had disappeared out of sight within the stem. The larvæ on the growing food-plant were visited with a light about 9 p.m. the same evening, when a few could be seen wandering about.

On July 17th a few of the terminal shoots of the growing sedge in the box appeared to be drooping, and, on examining the stems, perforations (in one case two in the same stem) were seen about 2 inches from the base of several stems. On July 18th the terminal shoots just mentioned were found to be distinctly withered in appearance. At this date, owing to prospective absence from home, it was deemed advisable to release the larvæ in the glass tube, and they were accordingly turned down upon the growing plant. Only hurried observations were practicable until September 1st, 1912. At this date many of the terminal shoots of the growing plant were withered and turned to a yellowish-brown colour, but it was not thought advisable to attempt to find any of the larvæ for fear of injuring them, and accordingly they were not disturbed.

In December, 1912, during my absence from home, that pest the "jobbing" gardener was called in, and apparently one of his very first actions had been to dig up the plant of *epigeios* ("squitch"!) from the box, and to cut it up and bury it in the adjoining soil. The scattered remnants were collected as far as possible and replanted, but the larvæ have in all probability perished. — G. BERTRAM KERSHAW; West Wickham, Kent.

HIBERNATION OF PYRAMEIS ATALANTA.—As a good deal has been written lately on this subject, it may be worth while to record some experiments which I made this winter. As I noted in vol. xlv. p. 299, of the 'Entomologist,' *P. atalanta* larvæ were quite abundant here in late September of last year. They were in all stages of growth, but the small ones seemed to feed up quicker than those I had in the summer. By the middle of October all had pupated, and contrary to



my July experiences the pupæ were all healthy, and out of a dozen only one really failed to emerge, although another, as I will mention later, did not become fully perfect. These dozen pupæ were kept in glass-covered flower pots in my sitting-room, and the first butterfly emerged during the last week of October. I then began to see what effect direct sunlight had on the emergence, and discovered that the pupæ which were exposed in the window on sunny days quickly emerged, but the result of holding them back in the shade and only giving them occasional doses of sunlight was to retard the latest emergences till the first week of December. For instance, one day these turned colour, and the wing markings of the butterfly were plainly visible through the pupa case. The next day one of these broke its shell under the influence of the sun's rays, but when I removed them into the shade again all growth seemed to stop; in fact, the partially emerged one never got any further at all, and its two companions delayed their arrival for two days. The perfect insects also were remarkably responsive to sunlight. Two or three, which were always kept in the shade, never moved at all from the time of their emergence till death cut short their careers. Others seemed to prepare for hibernation, but ten minutes' bright sunshine would galvanise them into the excitement of active life. I believe it is commonly the case with this family that the sexes take no interest in each other till after hibernation; certainly none of mine did. But, on the other hand, the somewhat confined space of a flower-pot was not very congenial to five or six lively and powerful butterflies! Early in December death carried off one after another of the butterflies. I fancy that it was the early morning frosts, felt even in a room, which caused them to die; I am all the more astonished to read Mr. Frohawk's account (*antea*, p. 40) of *atalanta* being found alive out of doors in February. For before Christmas all mine were dead.—J. S. CARTER, Warren Hill Cottage, Eastbourne.

THE AUDACITY OF A BIRD.—“It was either a very bold or a very hungry member of the feathered tribe (perhaps both), for I was sitting in my room, writing at a table not far away, when I heard a suspicious fluttering of wings in the neighbourhood of some freshly turned and turning pupæ hanging up to dry. I got up quickly, just in time to see a good sized bird fly through the open door out on to the verandah, where he boldly perched on the balustrade outside, with something in his beak. I turned to the pupæ to discover which I had lost by this unseemly and unlooked-for intrusion, and I soon saw that a huge larva of *Papilio polymnestor*, which I had hung up for pupation the night before, was missing; and though the last of a good many others of this species, it was an especially large one, and would no doubt have produced in due course a very fine female. It had been bred from an ovum. The bird who had paid me this unwelcome visit and thus partaken uninvited of my hospitality was about the size of a Starling.”—MARGARET E. FOUNTAINE, F.E.S., Khandala (Poona), India, Jan. 17th, 1913.

NOTES ON THE EARLIER STAGES OF *EREBIA EMBLA*.—Amongst the *Erebia embla* captured by me at Saeterstøen, in South Norway,

on June 5th last, were several females, one of which deposited an ovum whilst on the setting board. The larva from this emerged on July 11th. Immediately after emergence I measured it, and found it had a length of 2 mm.; the head was straw-coloured with a purple blotch, and a few specks of the same colour around the jaws. On each side of the head there was a conspicuous black spot. The head was large. The larva had a rather broad central dorsal and two narrow subdorsal purple stripes; the ground-colour of the general area was straw colour. The whole of the larva was thickly covered with inconspicuous spines. I measured it again on July 20th, when it had increased only to 3 mm. in length, after which date I could not find that it fed, and it did not further increase in size by July 28th, on which day it died. I tried the larva with various Arctic grasses, out of which it selected a very fine *Aira*, which much resembled *A. caspitosa*, and which was possibly that species. In feeding, it stretched itself out at full length on a blade of grass, with the head upwards, and commenced to feed at the extreme tip, eating towards the base, and leaving a thin strip of grass uneaten in its progress down the blade. *E. embla* is supposed, from the fact that it is only common in alternate years, to take two years to complete its metamorphosis, and the behaviour of my larva seems to lend colour to this view, for as the imago appears at the end of May, there does not seem time for much larval growth in the spring, whereas from the facts that the ova stage appears to last five weeks, and that the young larva took seventeen days to increase one millimetre in length, it seems probable that in a state of nature it hibernates for the first winter quite small, probably in the first stage, attaining its full size the following summer, and passing the second winter as a full-grown larva or as a pupa.—W. G. SHELDON, F.E.S., February 3rd, 1913.

HEMEROPHILA ABRUPTARIA EMERGING IN JANUARY.—On January 25th a specimen of *Hemerophila abruptaria* appeared in one of my breeding cages, and on February 8th another came forth. The larvæ from which they were reared were hatched out on May 19th of last year, and pupated between the middle of July and the first week in August. Throughout their existence they were kept in an outhouse where, except that they were sheltered from rain, they are well exposed to the weather, and where the pupæ have remained throughout the winter.—ROBERT ADKIN; Lewisham, February, 1913.

COLEOPTERA OF THE BRITISH ISLANDS.—The growing interest taken in the study of our native Coleoptera is exemplified by the fact that almost every month new species are being recorded. Coleopterists will therefore welcome the announcement that the Rev. Canon W. W. Fowler has, in collaboration with Mr. H. St. John Donisthorpe, prepared a sixth and supplementary volume to his standard work 'The Coleoptera of the British Islands.' The last volume of the series was published in 1891, and the present volume brings the work entirely down to date. The Large Paper Edition of the present work ( $10'' \times 6\frac{3}{4}''$ ) contains, in addition to three plates from photographs (which are also included in the smaller edition,  $8\frac{3}{4}'' \times 5\frac{1}{2}''$ ), no fewer

than twenty coloured plates, depicting two hundred and fifty-five species. Mr. Donisthorpe has contributed to the volume a special paper on the British Myrmecophilous Coleoptera. We understand that both the large and small paper editions, which are being published by Messrs. Lovell, Reeve & Co., Ltd., of 6, Henrietta Street, Covent Garden, London, are to be ready by March 15th.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Annual Meeting, Wednesday, January 15th, 1913.*—The Rev. F. D. Morice, President, in the chair.—Mr. J. E. Collin, one of the Auditors, read the Treasurer's Balance Sheet for 1912, showing a balance of £16 18s. 9d. On the proposal of the Rev. F. E. Lowe, seconded by Mr. H. Main, it was unanimously adopted.—The Rev. George Wheeler, one of the Secretaries, then read the Report of the Council. Mr. A. Bacot proposed that the Council's Report be adopted. This was seconded by Dr. T. A. Chapman, and carried unanimously. The President then put the Council's list of nominees for the Officers and Council for the ensuing session to the meeting and asked for a show of hands. The following were then declared elected unanimously:—President, G. T. Bethune-Baker, F.Z.S.; Treasurer, Albert H. Jones; Secretaries, Commander J. J. Walker, M.A., R.N., F.L.S., and Rev. G. Wheeler, M.A., F.Z.S.; Librarian, G. C. Champion, A.L.S., F.Z.S.; other members of the Council, R. Adkin, James E. Collin, J. Hartley Durrant, Stanley Edwards, F.Z.S., F.L.S.; H. Eltringham, M.A., F.Z.S.; A. E. Gibbs, F.L.S., F.Z.S.; Rev. F. D. Morice, M.A.; G. W. Nicholson, M.A., M.D.; Hon. N. C. Rothschild, M.A., F.L.S., F.Z.S.; W. E. Sharp, J. R. le B. Tomlin, M.A.; Colbran J. Wainwright. The President, the Rev. F. D. Morice, then delivered an address, at the close of which Mr. C. J. Gahan proposed a vote of thanks to him for his services as President and for his address, at the same time asking for its publication as a part of the Proceedings of the Society; this was seconded by Mr. C. Fenn, and carried unanimously. The President having replied with a few words of thanks, Mr. G. Meade-Waldo proposed, and Professor Selwyn Image seconded, a vote of thanks to the Officers of the Society for their work during the past year, which was also carried unanimously. The Treasurer and both the Secretaries returned thanks, the former referring to the generosity with which Dr. Chapman had for years contributed towards the expense of the plates published in the Transactions.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — Annual Pocket-box Exhibition, November 28th. — Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. C. N. Freeman, of Sanderstead, was elected a member.—Mr. A. E. Tonge exhibited species taken and bred by him during the season, including *Heliothis marginatus*, *Agrotis cinerea*, *Oncocera ahenella*, *Notodonta phæbe* (*dictæa*), &c., from Reigate; *Polia chi*, from Winslow, Bucks, *Leucania albipuncta*, *Noctua stigmatica*, *Bryophila muralis* var. *impar*, from Deal, &c.—Mr. B. H. Smith, thirty specimens of *Phryxus*



*livornica*, taken at light in South Cornwall in May.—Mr. R. Adkin, long and varied series of *Anthrocera lonicerae*, *A. trifolii* and *A. filipendulae*, and called attention to the similar colour aberrations occurring in all three species, from normal deep red, through pale red, orange to yellow by small gradations.—Mr. A. Sieh, the two very rare Coleophorids obtained by him this year, *Coleophora trigeminella* and *C. agramella*, the latter from East Hoathly, Sussex.—Mr. E. P. Sharp, an extensive series of the Sussex forms of *Dianthæcia carpophaga*, and dark and red forms of *Nonagria edelsteni*.—Captain Cardew, an almost obsolete under side of *Celastrina argiolus* near ab. *argyphontes*, from Oxshott.—Mr. T. H. L. Grosvenor, a very long series of *Cænonympha typhon*, from Witherslack, Cumberland and Scotland, and pointed out the gradual suppression of the spotting as the species occurs more to the north. He also showed *Agriades coridon* ab. *semisyngrapha*, ab. *inæqualis*, ab. *aurantia*, and ab. *tithonus*, *P. rapæ* from Aberdeen with females varying from pale yellow to buff, under side aberrations of *Aphantopus hyperanthus*, *Cænonympha pamphilus* and *Aricia medon*, and a *Triphæna pronuba* with pale lemon-yellow hind wings.—Rev. J. E. Tarbat, a series of *Crambus fasciellus*, from Norfolk.—Mrs. Hemming, 2 broods of *Colias edusa* bred from ova laid by females captured on May 21st and July 21st respectively; there was but little variation in brood 1, while the males of brood 2 showed a diminished amount of spotting on the hind wings, and the females had considerable suppression of the fore wing marginal spotting. Mrs. Hemming also showed aberrations of *Pieris napi*, a melanic *Anthrocera trifolii*, a dusky-fringed *Agriades thetis*, a green-tipped male *Euchloë cardamines*, and a female *C. edusa* right side ab. *helice*, &c.—Mr. L. W. Newman, a long bred series of hybrid *ocellatus populi*, examples of other hybrids previously shown by him; extremely large bred *C. edusa*, a melanic example of *Cosmia trapezina* from Bexley, and a yellow *Polygonia c-album*.—Mr. H. J. Turner, series of *Bryophila muralis* from Freshwater and Dawlish, the former light green and gray in ground, the latter dark and intense in colour and marking; two specimens were smaller than *B. perla*.—Mr. A. E. Gibbs, a drawer of the brilliant South American genus *Catagramma* and its allies.—Mr. W. J. Lucas, a number of species of Neuroptera, most remarkable for their strikingly exaggerated form of wing, including *Nemoptera bipennis* from Gibraltar, *N. coa* from Corinth, *Lertha barbara* from Algeria, &c.—Dr. T. A. Chapman, a series of *Agriades thersites* with *A. escheri*, *Polyommatus icarus*, &c., for comparison; and he called attention to the overlapping of the flowering time of *Ulex europæus* and *U. nanus*.—Mr. Wells, an unusually large specimen of *Apatura iris* and a *P. c-album*, with much reduced costal blotches and dark suffused hind wings.—Mr. R. T. Baumann, a melanic specimen of *Acidalia virgularia* bred from a captured melanic female, and a long series of *Hydriomena furcata* (*sordidata*) from Forres, showing banded, vinous, and very dark forms.—Mr. J. A. Simes, a long and varied series of *Melitea didyma* from Europe and North Africa, including the small pale form ab. *persea* from Greece, the huge South Italian form, and a beautiful radiated aberration.—The Rev. Alfred Stiff, a series of



*Epinephele tithonus* with extra ocelli well developed; *Aphantopus hyperanthus* with large and richly coloured ocelli; a *Celastrina argiolus* the size of *Cupido minimus*; *Pyrameis atalanta* with the fore-wing bands broken, one with light vermilion bands, and one with partially yellow bands on the hind wings.—Mr. A. G. Scorer, a *Eugonia polychloros* with three heavy spots on the inner margin of the fore wing; a *Xanthorhoë sociata* with the band reduced to a couple of spots; a *Boarmia repandata* with the white band bordered with a blackish brown belt; and a *Triphæna comes* (*orbona*), with the black submarginal band of the hind wings broken into irregular rays.—Mr. G. T. Porritt, series of two fine forms of *A. grossulariata*, one near *hazeleighensis*, with the orange band very broad and the outer margins broadly white, and the other a heavily marked form with the yellow almost obsolete.—Mr. L. W. Newman, the paintings of the aberrations bred by him during the last two seasons.—Mr. W. J. Kaye, species of the genus *Heliconius*, with aberrations of each species, showing melanism in both fore and hind wings, including *H. numata*, *H. ismenius*, *H. thelxiope*, *H. alithea*, *H. melpomene*, *H. erato*, *H. doris*, &c.—The Rev. G. Wheeler, five examples of the hybrid *Agriades polonus* from Assisi, *Agriades thetis* ab. *punctifera* from Africa, ab. *cælestis* from South-west France, and ab. *urania* from Dorking; under sides of *Dryas paphia*, including ab. *dives*, a new form from Algeria, &c.—Mr. J. Platt Barrett, *Polyommatus icarus* taken in 1911 and 1912, to show that those of the former date were much more brightly marked than those of the latter year.—Mr. W. J. Ashdown, a xanthic aberration of *Epinephele jurtina*, a very variable series of *Calymnia trapezina*, and a very fine range of variation in *Chiasmia clathrata*.—M. Stallman, *Aricia medon* from Margate, showing some white round the discal spots; a female *Colias edusa* with only traces of spots on the marginal bands; a *Cosmotriche potatoria* with a semicircular sinus in the hind wing, bred from a Wicken cocoon; and a *Hypocrita jacobææ* with some of the red markings yellowish.—Dr. G. S. Robertson, a dark banded *C. trapezina*, three confluent forms of *Anthrocera trifolii*, blue females of *Agriades thetis*—the two last from near Dorking—bred specimens of *A. meliloti* from the New Forest, *Cymatophora octogesima* from a fence in Dulwich, &c.—The Rev. G. H. Raynor two new forms of *A. grossulariata*: (1) a dark and radiated form of ab. *lacticolor*, and (2) an orange-coloured form of ab. *flavipalliata*.—Mr. Stanley Edwards, examples of the groups of the genus *Papilio* which occur in the Ethiopian region, including *P. antimachus*, *P. zalmoxis*, *P. ridleyanus*, *P. cynorta*, *P. hesperus*, *P. leonidas*, *P. demoleus*, *P. menestheus*, *P. polices*, *P. fulleri*, *P. latreillanus*, *P. niveus*, *P. colonna*, and *P. phorcas*.—Mr. B. N. Crabtree, a very long series of *A. grossulariata*, including the well-known forms *nigrosparsata*, *varleyata*, *lacticolor*, and *lutea*, and most of the aberrations named and described by Rev. G. H. Raynor; a long series of *A. sylvata* (*ulmata*), including many smoky forms; two *Nemeophila plantaginis* with the black markings absent, the ground being pale ochreous yellow; and five aberrations of *Eustroma reticulata* (see Entom. xlv. plate i.).—Mr. H. W. Andrews, a collection of predaceous Diptera illustrating the

work of Professor Poulton, including British species of the Asilidæ, the Empidæ, the Dolichopodidæ, the Cordylurid *Scatophaga stercoraria*, and the Anthomyid *Cænobia tigrina*.—Mr. M. E. Moseley, mounts illustrating the various stages in the metamorphoses of *Sialis lutaria*, *Ephemera danica*, *Brachycentrus subnubilus*, and *Dictyopteryx microcephala*.—HY. J. TURNER, *Hon. Rep. Secretary*.

## RECENT LITERATURE.

*Catalogue des Lépidoptères Observés dans L'Ouest de la France.*  
Pte. 1, Macrolépidoptères. By HENRI GELIN and DANIEL LUCAS. 8vo, pp. 232. Published by the Authors: 2, Rue Beaune la Rolande, Niort, Deux-Sèvres, France. 6 frs.

THE Lepidoptera of Western France have a peculiar interest for the British student collector, inasmuch as that part at least of the region to the north of the Loire approximates in many respects, climate, formation, and flora, to our own southern counties. At intervals local catalogues of Lepidoptera have been published by some of the learned and scientific societies of the western Departments, but until the publication of MM. Gelin and Lucas's work there has been no reliable review of the whole Atlantic region from Finistère to the Basses-Pyrénées. The authors, however, are not content to put forward a mere list of captures, or to collate records already in print. In a suggestive preface M. Gelin sums up the characters of the several seaboard and inland Departments included; and, though modestly describing his own observations as no more than material to assist further scientific research, he throws much light on problems of distribution. M. Lucas, also, expatiates on the wonderful results obtained among the Heterocera by the use of modern illuminants, and incidentally upon the wide field thus made available for the naturalist who is satisfied to work within, what many of us to-day consider, a too restricted area. The Catalogue before us affords perhaps the best excuse for the home collector in the west of France; for the region is seen to be as rich in the variety of its Lepidoptera as of soil and scenery, ranging from the sandy heaths and dunes of the Biscay littoral to the wooded chalk hills of Charente, and the granite silences of Bretagne. To the growing number of British entomologists who travel the name of M. Lucas is familiar as the discoverer of the fine large form of *Hesperia serratulæ* var. *occidentalis*, which, as we are now informed, predominates in Vendée, Vienne, and the Deux-Sèvres. Hardly less exhaustive is the account of *Cænonympha edipus* and its several forms, which once upon a time we thought confined in France to the marshes of Biarritz, St. Jean de Luz, and Guéthary, and chased in vain for want of knowledge of the date of emergence thereabouts. Nor is the consideration in this volume of the Heterocera less thorough, and we commend it the more cordially, therefore, to entomologists who would know something definite of the life-history,

and the chances of successful establishment in England of the occasional, unexpected, and inexplicable moth-immigrant. Curiously enough, of the ten *Plusiidae* which figure in the Catalogue, *Plusia moneta* (a recent colonist with us) is not to be found; though *P. ni*, which we have watched ovipositing on the rhododendrons of the Hautes-Pyrénées, reaches the valley of the Loire (the food-plants given here are nettle and *reseda*); so that the former, may be, found its way to us from the south-east. But in the short space at our disposal it is, of course, impossible to do more than draw attention to a single typical instance. Let me, however, recommend a close study of this admirable Catalogue to all lepidopterists working at home, and the addition of a copy of it to the travelling library of any who are contemplating a spring or summer tour in Western France. I may add that the volume on the *Micros* is in an advanced stage of preparation, and will be published shortly.

H. ROWLAND-BROWN.

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*The Dictionary of Entomology.* By N. K. JARDINE, F.E.S. London: West, Newman & Co. 6s.

THE title of this well-printed book is what catches the eye; it is presumptuous, and presumption pays, as a rule, nowadays—we hope this book will. For it is a good book; and contains, we have no hesitation in saying (not being presumptuous), a great deal we did not know. The author is a Classic rather than an Entomologist, and gives us the true meaning of the words rather than that in which they are now used in our somewhat slipshod descriptions. For, in reality, this is a Dictionary of [the classical meaning of the descriptive terms used in] Entomology, though we cannot always bow to that given; *e.g.*, the anal angle of the wing is that “between the dorsum and the tergum” (the last word is, perhaps, a *lapsus calami* for “termen”), &c. That its 258 pages contain most of the terms in general use is proved by testing it by the February number of the ‘Entomologist,’ in which there are but four descriptive terms not there given, one of which (callipers) is a bad oversight. The book is worth its price.—C. M.

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*Eugenio Rignano upon the Inheritance of Acquired Characters.*  
Authorized English Translation by BASIL C. H. HARVEY.  
Chicago: The Open Court Publishing Co. 1911.

THIS book deals with some of the deepest and most interesting of biological problems, considered from the point of view of one who is not only “a student of Biology,” but “has the training of an engineer and physicist,” as the translator in his preface tells us.

The author “offers an explanation on a physical basis of assimilation, cell division, and the biogenetic law of recapitulation in ontogeny, and he suggests a mechanism whereby the inheritance of acquired characters may be effected.” He brings under review a number of



different theories of heredity, and finds them all unsatisfactory. Some he rejects as altogether untenable, inasmuch as they do not even profess to explain the inheritance of acquired characters. Chief among these is Weismann's theory of the germ plasm, which our author maintains does not even succeed in giving a rational explanation of the law of recapitulation in ontogeny. Other theories, which seem to be more in harmony with his own, he looks upon as being much too vague and nebulous.

Although the idea underlying it is simple enough, the mechanism which the author suggests as an explanation of the inheritance of acquired characters and of the repetition of the phylogenetic history in the course of ontogeny is of so extremely complex a character, and is based so much on the assumed behaviour of that form of energy which he calls *nervo-motive force*, that it is by no means easy to understand it or to decide how far theoretically it is workable and sound. The idea is that a nervous current, like an electric current, in passing through an accumulator can cause the deposit there of a material substance—a potential element, which in its turn can give rise to a current in the reverse direction corresponding to that which caused its deposit. It is suggested that in the living organism the nervous accumulators are situated in the nuclei of the cells. When a functional stimulus is given, say by the use of some organ or in response to the environment, the dynamic equilibrium is disturbed, a nervous current flows, and in every nucleus through which it passes there is deposited a potential element—in the germ cells as well as in the somatic nuclei, although, so far as heredity is concerned, the latter do not matter, since they are lost with the life of the individual. Up to this point the analogy with electricity helps us to understand. The electric accumulator is capable of giving off a current similar to that which caused the deposit, and differing from it only in intensity. But the nervous accumulator is no such simple affair. It must needs be an accumulation of accumulators, each of which is capable of giving rise to a current of a specific intensity corresponding to the current which caused the deposit in it of the specific potential element. To find out further how the machinery would work, our readers must refer to the book itself, in which also they will find an abundance of extracts from the writings of speculative philosophers, and an interesting chapter on memory, which is explained on the same lines as ontogeny and the inheritance of acquired characters. It is to be noted that the author, although a firm believer in the inheritance of acquired characters, is candid enough to admit that no irrefutable evidence has yet been brought forward to prove that acquired characters are inherited.

C. J. G.



## OBITUARY.

GEORGE BAKER.

At the beginning of last month, in the island of Guernsey, there died at the advanced age of eighty-three years, George Baker, who although probably but little known to the present generation of entomologists, was half a century ago one of the keenest and best of our British Lepidopterists.

Baker, who was by occupation a gardener, was born at Chelsea. In the late fifties his work took him to Sheffield, where his taste for entomology seems to have been developed by association with several well-known working men collectors who resided there. He was one of the very few lepidopterists who have taken *Gastropacha ilicifolia* in Britain, of which species, it is recorded in the magazines of that date, he bred two imagines in 1860 from larvæ taken the preceding autumn on the moors around Sheffield, which specimens after various vicissitudes came into my possession some years ago.

Some years later Baker obtained the position of Head Gardener of Coolings Nurseries at Derby, which he held until 1877. It was whilst residing in this town that he became associated with Harper Crewe in working out the life-histories of the Eupithecæ; he was one of Crewe's chief assistants, actually discovering himself the larvæ of several species, and assisting with others; and thus he became known as one of the principal "pug" men of that period.

He was a very keen and acute field entomologist, and obtained in numbers many species then considered very rare, disposing of his surplus specimens to purchase other species that he wanted for his collection. When I commenced to take an interest in entomology—in 1876 I think it was—I paid him a visit, and well remember his pointing out with pride that his cabinet of about forty drawers was exchanged with a well-known London dealer for the surplus *Xanthia gilvago*, until then very rare, which he had bred in one season. His specimens were keenly sought after for their perfect setting and condition.

In 1877 Baker was induced by the late Dr. Mason of Burton-on-Trent to become his Curator, which position he held jointly with the late John Sang, until the close work at his employer's collection resulted in the loss of an eye.

For a number of years now he had resided in Guernsey, to the fauna of which island, the Rev. F. E. Lowe informs me, he added several species of Lepidoptera, chiefly amongst his favourite genus the *Eupithecia*; and continued to take an active interest in entomology until the end, actually calling upon Mr. Lowe with a box of specimens he wished to discuss a few weeks before his death.

His collection when he left Burton-on-Trent was incorporated with that of Dr. Mason.

Baker was twice married, his second wife survives him.

W. G. S.





A. E. G. Photo.

G. & B. Ltd.

THE BRIDGE AT MOSTAR.

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## VARIETY OF *ARGYNNIS ADIPPE*.

BY F. W. FROHAWK, M.B.O.U., F.E.S.



*Argynnis adippe* var.

THE above figure represents a remarkable variety of *Argynnis adippe* (male), captured in Kent, July 7th, 1888, now in the Tring Museum, and kindly lent me by the Hon. Walter Rothschild. The upper side has the fulvous ground colour rather paler than in normal examples, and the whole of the usual black markings are replaced by a very pale leaden or pearly-grey colour; the usual olive basal area of the wings of *adippe* is, in this specimen, inclining to pinkish-buff, and somewhat paler than the rest of the ground colour. The under side is similar in colouring to the upper, excepting that the spots on the upper wings are rather more leaden; the hind wings are without the usual greenish-ochreous tint at base and inner margin, but the silver spots are normal in both colour and pattern. The antenna, head, thorax and abdomen are much paler than in typical specimens. The black pigment is entirely absent from every part of this insect. Varieties of this form of partial albinism are extremely scarce.

I am also indebted to Mr. A. E. Gibbs for the loan of another specimen of *A. adippe* of the same form of variation; the only difference is in the spots on the under surface of the fore wings, which are pale rusty-brown. In other respects it is identical



with the one figured; it is likewise a male, and was captured in the New Forest in July, 1901.

Commander J. J. Walker has kindly informed me that a very similar variety of *A. aglaia* exists in the "Dale Collection," now in the Oxford University Museum, which he described in the Entom. Mon. Mag. vol. xviii. p. 101. The specimen is labelled "Dover, Leplastrier," and referred to by the Rev. W. T. Bree in Loudon's Mag. Nat. History, 1832, p. 334. It is stated to have been taken in a remarkably wet season.

A similar variety of *A. euphrosyne* is figured in Mosley's 'Illustrations of Varieties of British Lepidoptera,' pt. 5, pl. 3, fig. 1; the specimen, it is stated, was captured at Barnwell Wold by T. H. Briggs, and passed into the collection of Mr. Howard Vaughan.

It would be of great interest if other entomologists would record the existence of any similar albino varieties they may know of, with a view to ascertain what species are liable to the same form of variation.

## BUTTERFLY-HUNTING IN THE BALKANS.

BY A. E. GIBBS, F.L.S.

(Continued from p. 108.)

(PLATE VIII.)

MONTENEGRO.

CETTIGNE, the tiny capital of the land of the Black Mountain, is situated at the end of one of the comparatively fertile little plains which the traveller finds here and there in the desolate limestone mountains which are such a characteristic feature in the scenery of this part of the Balkan peninsula. This bare and treeless region, almost devoid of vegetation, is known as the Karst, and the sight of it does not inspire the butterfly-hunter with anticipations of a very profitable expedition; but for all that I found it most interesting ground. There is practically only one hotel in Cettigne, "The Grand," a not very ambitious or palatial place, but it is clean and comfortable, and the charges are quite moderate. I spent a few very happy days there, and my experiences, both of the country and the people, were of the pleasantest. It was a long day's ride from Ragusa to Cettigne, first by steamer to the Dalmatian town of Cattaro, on the beautiful land-locked Bocche of the same name, and thence by automobile up the wonderful road which climbs the far-famed Black Mountain and connects Cettigne with the outer world. When I awoke on the morning after my arrival the country was bathed in sunshine, and I lost no time in setting out to explore

the neighbourhood. Behind the hotel is a park where the band plays on Sundays, and beyond it rises a mountain slope clothed with wild sage and other plants, quite a flowery bank for Montenegro. I made my way to this, hoping to find *Thais polyxena*, which I knew occurred somewhere hereabouts, and in a short time I secured four specimens, not in very first rate condition, for June 7th is a late date for this species. My time on the hillside, however, was limited, for I had to return to the town to keep an eleven o'clock appointment with the British Minister, the Count de Salis. To that gentleman I am indebted for many little kindnesses and much information which helped to make my stay in Montenegro pleasant. *Pieris ergane* was in evidence on the hillside, and I got a rather interesting series, including the aberrations of the female, upon which Rostagno has bestowed the names *magnimaculata*, in which the spots are much enlarged, and *longomaculata*, in which they are elongated and united to form a cloudy band. But the commonest Pierid appeared to be *P. brassicae*, which was to be seen everywhere. After lunch I climbed the hills in another direction, but was not so fortunate as in the early morning, for I struck upon a district where the slopes were covered for the most part with loose stones, with hardly any flowers to enliven their desolate appearance, and only some low scrub around which nothing was flying. The next morning was dull, but I decided to try my luck on the road to Rjeka and to visit the Belvedere, from which place I was told a fine view was to be obtained. Some rain fell soon after I started, and I had to take shelter under the bushes, but I found *Pararge mæra* flying between the showers. Persevering, I reached the Belvedere, and was well rewarded for my walk. A rough pavilion is erected on a commanding rock, and from it a most wonderful panorama of mountain, valley, lake and stream is to be seen. Fifteen hundred feet below lies a deep valley stretching right away towards the distant lake of Skutari, the shores of which are partly Turkish and partly Montenegrin, while on the horizon the gloomy mountains of Albania rise, peak after peak, in endless succession. They are known as "the Mountains of the Damned," and their terrible slopes are said to have never been climbed by a stranger. What entomological treasures they contain no one knows, but perhaps recent happenings may hasten the day when it will be safe for the butterfly-hunter to venture into that lawless country, now inhabited by fierce and half civilized people, with some of whom I came in contact a few days later in the cattle-market at Podgorica. The weather had brightened a little, and occasional rays of sunshine enlivened the scene, lighting up the waters of the distant lake. At my feet was the excellent road made by King Nicholas, winding down the steep slopes of the rock-strewn valley, which had repeatedly proved a death-trap to the hoardes of Turks, who for so many

centuries vainly tried to subdue the Montenegrins. While taking a photograph of this glorious scene, perhaps the finest view I have ever looked upon, *Limenitis camilla*, fresh as paint, settled on the rock beside me, and before I could put down the camera and take up the net it had sailed away over the trees to my right. This little woodland fairy proved a good guide, for on trying to follow it I struck a narrow path which led me into a tiny meadow, probably little more than an acre in extent, which proved to be one of the best butterfly corners I discovered in Montenegro. I remained there catching lepidoptera until it was time to hurry back to Cettijne for lunch. Often a sweep of the net yielded four or five different species. Here I made my first acquaintance with *Hesperia sida*, one of the most striking insects of its group. *H. orbifer*, too, was there, with *Spilothyrus lavatera*, and beautifully bright specimens of *H. sylvanus*, which glistened in the sunshine like "coppers." There was also a black and white skipper which I hesitate to name. Of "blues" there were *Nomiades cyllarus*, *Cupido minima*, a fine large and bright form of *Plebeius argus*, L., *Polyommatus icarus*, *Cyaniris semiargus*, and *Lycæna orion*. *Thais polyxena*, a poor, battered object, was fluttering over the grass, and among the bushes *Cænonympha arcania* was found. On the previous day I had taken an interesting form of *C. tiphon* which puzzled me, and now I caught seven more specimens. It turned out to be the variety *rhodopensis* of Elwes, and resembles somewhat our northern form, the *scotica* of Staudinger, but is of a much lighter and brighter tint than the Scotch insect. There are no ocelli on the upper side, but in some of my specimens the apical spots of the under side show through. Dr. Seitz states that the hind wing of this form on the under side mostly exhibits a complete row of ocelli; but my Montenegrin specimens, and also a few I took at Jablanica, in the Herzegovina, are very variable in this respect. Some of my females have the full complement of six ocelli, which are almost as conspicuous as in the typical *tiphon* of Von Rottenburg, which I take to correspond to the British middle form, as described by Buckle in his well-known article on this species.\* In the majority of my specimens, however, the ocelli are but feebly developed, and I secured at Cettijne one male of the form which Rebel has described from Bosnia and Herzegovina under the name of *occupata*, in which the spots are entirely obsolescent. There is considerable sexual variation in colour, the males being darker than the females, the veins and costal and outer margins conspicuously so, and in one specimen the hind wings are so much darkened that at the first glance I took it to be *C. iphis*. The under side, too, is much brighter than typical *tiphon*; the fore wings, except for their ashy-grey apices and margins, being generally unicolorous. Mr. Elwes in his description of the

\* The 'Entomologist's Record,' vii, p. 100.



variety, published in the Entomological Society's 'Transactions,' 1900, p. 205, says that it differs from the normal European form in having, in most cases, the apical band of the fore wing below obsolete, but that about one-third of his specimens show a trace of the band. My specimens agree with those of Mr. Elwes, for I have three or four examples, mostly females, in which a rudimentary band can be seen, and in these specimens the apical eye-spot is also well developed. The ground colour of the hind wings, especially of the females, is of the same *pamphilus*-yellow which prevails throughout. Altogether, *C. var. rhodopensis* is a most attractive form of this variable species.

After lunch I determined to re-visit the flowery hillside behind the hotel, following up a narrow path which I afterwards found was the old road to Rjeka. Here I again met with the local form of *tiphon*. A pupa of *Aporia crategi* was discovered, from which in a few days the butterfly emerged. Two very common insects were *Venilia maculata* and *Vanessa cardui*, and I found a colony of Zygænid larvæ on wild sage, which I was unable to rear. The path wound about among the mountains, and great was my surprise, on crossing a ridge, to find myself above the high road close to the Belvedere, which I had visited earlier in the day. So I determined to pay another visit to the little meadow, but a curious incident interfered with my plans. As I descended to the road I heard what I thought to be a number of boys coming from the direction of Cettijne, and singing songs as they walked along; but hardly had I reached the pavilion when I discovered that the noise proceeded from a regiment of khaki-clad soldiers, marching along the road without any sort of order. As I watched them they formed up, and standing at the entrance to the path leading to the meadow an officer addressed them at great length, apparently on the subject of taking cover. So well was the lesson learned that a few seconds after the order to disperse had been given not a soldier was to be seen except the officers who had remained upon the road. But interesting though this little incident was it quite spoiled my afternoon's work, for access to the meadow had been cut off, and I was not able to enter it until the sun had sunk behind the mountains, and nothing worth speaking of was to be found. Other excursions in the neighbourhood of Cettijne yielded *Papilio podalirius*, *Brenthis euphrosyne*, both apparently nearly over, *Epinephele janira* (males only), *Hesperia tages*, *Euchloë cardamines*, *Colias edusa*, *Leptosia sinapis*, and *Melitæa cinxia*.

From Cettijne I wanted to go to Skutari, a Turkish town which has lately become famous in connection with the unfortunate war which broke out a few months after I returned home from the Balkans. But Turks and Montenegrins had already begun to quarrel, and the steamer which usually plies



upon the lake, between Rjeka and Skutari, had stopped running. So I changed my plans. Learning that at Rjeka, one of the most beautifully situated places I visited, there was no hotel fit to stop at, I decided to go on to Podgorica, upon which in a few weeks the eyes of the civilized world were to be fixed, for it is the border town where the Montenegrin army was mobilized, and near to which the first battles of the war were fought. It was a most interesting spot, and much might be written about it, but I must only relate my entomological experiences. My first walk was in the direction of the Turkish frontier, and here, on a hill-top, both the common European forms of *Papilio* were flying. But the wind was very strong, and although I spent a considerable time trying to catch an elusive specimen of *P. machaon*, which appeared to me to be of a very dark orange colour, I was unsuccessful, the examples of both species which fell to my net being in no way remarkable. On the slope of the hill *M. didyma* was flitting from flower to flower, and in a Turkish graveyard at its foot *Anthocaris*, var. *ausonia*, was present in abundance. The only other noteworthy insect was *Satyrus semele*, of which I found a fine, well-marked form on the hills round Podgorica. I think the specimens were the largest I have seen, being 60 mm. in expanse. The next morning I climbed the mountain on the opposite side of the town, where I found all the species of the previous day, as well as *Pieris rapæ*, *P. ergane*, *Epinephele janira*, *Pararge megæra*, *Rumicia phlæas*, *Thecla spini*, and a very pretty and abundant Pyralid which was present in thousands in the grass everywhere.

Another day at Cettijne permitted me to visit again the Belvedere, where I added *Polyommatus astrarche* and *Pararge ægeria* to the list.

#### HERZEGOVINA.

On Friday, June 14th, I arrived at Mostar. I left Gravosa in the early morning in bright sunshine, and from the railway, high up above the shores of the Ombla, I caught sight of my old hunting-ground at the source of that river. Some fine views of the Adriatic on the one hand, and of the cypress-covered hills on the other, were obtained; but soon we turned inland, traversing a more desolate region of bare rock and scanty cultivation. For more than an hour we travelled by the side of the bed of a lake, which is only a lake for about five months of the year. It was for the most part dry and laid out in small patches for cultivation, water still covering the lower levels. When I passed it again a month or so later the crops were fast approaching maturity, and the cows were being pastured in places which now appeared to be only mud. It was curious to notice the boats lying on the hillside in spots which in winter would presumably be the water's edge, but now far above the level

of the little river which trickled along amid fast-drying pools in the bottom of the valley. This curious lake bears the unpronounceable name of Popovopolje, and in summer its waters are said to find a subterranean outlet. The water system of the Balkans presents many curious phenomena of this kind, full-grown rivers issuing from cliffs, and streams disappearing in fissures of the earth in a remarkable way. The bright morning was succeeded by cloud and rain, and it was wet when I left the shelter of the hotel Narenta, at Mostar, to explore the sights of this oriental city, and to admire its incomparable bridge, perhaps the most interesting structure in the Balkans. Much valuable time was wasted in an endeavour to get a permit to take photographs, which was absolutely refused me by the commander of the garrison, but I got my way by telegraphing direct to the headquarters of the military district at Ragusa. So that afternoon slipped away, and I was not able to do any entomological work until the next morning. Its early hours were cloudy, but while I was having my coffee the sun came out, and a *Pieris brassicae* was seen flying in the little public park in front of the hotel. This decided me to try my luck on the north-west of the town, along the railway line. At first nothing but a few *Anthocaris*, var. *ausonia*, were to be had, but as I got further away from Mostar matters improved. The hillsides are highly tilled wherever cultivation is possible, the vine being grown on the lower slopes. I followed a narrow lane leading upwards between the vineyards, and on a thistle-head a beautiful female *Dryas pandora* was sunning herself. She fell a victim, and, hoping for others, I lingered near the attractive flowers; but although no more *pandora* were secured at this spot, I caught two *Argynnis adippe*, var. *cleodoxa*, which seems to be the prevailing form of this species in the Balkans. *Libythea celtis*, just out of the chrysalis, was sporting along the thorny hedgerows, where it was well protected and difficult to get without tearing the net. A nice specimen which I succeeded in capturing was unfortunately smashed between the cork and the bottle, and although a fair number of others were seen I only carried one *celtis* home. A green hair-streak was observed, and hoping for *Thecla aris*, I caught it; but, like all other specimens I captured in this part of the world, it proved to be only the common species. A male *Argynnis phæbe* next came along, and in a meadow two *Melitæa didyma* were added to the bag. On the hillside *Pieris ergane* was abundant, and *Polygonia cgea* flew round the bramble blossoms. Three more *D. pandora* were accounted for on the way home, as well as a very respectable specimen of *Hesperia sidae*. The Lycænids taken during the morning were *Agriades thetis*, *Polyommatus astrarche*, *P. escheri*, *Thecla spini*, and *Rumicia phleas*.

Mostar is compressed into a few long streets on either bank

of the river Narenta by the precipitous fortress-crowned hills which dominate the valley. Their slopes are very difficult to negotiate, being covered with large loose stones, but I noticed patches of garden ground, and, here and there, higher up, some grassy places, so I thought it might be worth while to see what insect life was to be found there. I therefore scrambled up the slope above the new Servian church, and as the morning was a very hot one I soon regretted my decision. *Thecla spini* and *Pieris ergane*, both in abundance, were the two insects which divided possession of these rough places, with a few stray specimens of *P. egea*, *Satyrus semele*, and *A. var. ausonia* to keep them company. It was here among the fruit trees in a garden, in a little gully, that I saw the only example of *Charaxes jasius* I met with this year; but the nature of the ground forbade pursuit, and I was forced to be content with a passing glance.

The Narenta is one of the most remarkable streams in Europe. I know of no finer scenery anywhere than is to be found in the gorges of some of the Balkan rivers. We have to thank the Austrians for opening up this land of wonders to the traveller, and for giving, not only security of life and property in a country which, less than forty years ago, was only visited of dire necessity and with a strong escort, but also for constructing railway lines and carriage roads through defiles like that of the Narenta, making their scenery easy of access. The journey from Mostar to Jablanica, by the side of the Narenta's foaming waters, was most enjoyable. At the latter place where a mountain stream, the Rama, joins the larger river, the Government has built a little hotel, and is trying to make it popular as a summer resort. It is unpretentious but quite satisfactory, meals being served under the shady trees in a pretty garden. On June 18th I walked up the valley with my net, and found the railway banks provided a good hunting ground. On a clump of dwarf elder growing by the roadside I took a nice series of *Argynnis daphne* and *Chrysophanus alciphron* (type) in beautiful condition, and also a fresh female specimen of *A. hecate*, my proceedings being watched with evident amusement by a picturesque group of platelayers in oriental costume, who were repairing the line. *T. ilicis* and its var. *cerri* were also to be found on the flower-heads, and *A. var. cleodora* was among the desirable things captured. Other insects seen during the morning were *A. daphne*, *P. c-album*, *P. rapæ*, *E. janira*, *L. sinapis*, *R. phleas*, *P. podalirius*, *D. paphia*, and *Eugonia polychloros*.

In the afternoon I went on to Sarajevo, where I had arranged to meet Mr. P. J. Barraud, but I resolved to return later on and explore some of the higher ground, Jablanica being an excellent centre for the purpose. It was not, however, until July 9th that I was able to carry my resolution into effect. On that day, in



company with a guide, I left the hotel and climbed to a high point called the Plaça, spending the day on the mountains. As we passed the castle-like barracks on the hill *podalirius* was flying, and as the guide anxiously urged me to catch it I did so, but the loss of a tail saved its life. The way led for the most part under the shade of trees, and consequently very little insect life was to be seen, but on a flowery slope two beautiful *Polyommatus meleager* proved welcome captures, and on my return a male in good condition was awaiting me on the same spot. A species which I anticipated getting during my Balkan journey was *Neptis lucilla*, but I saw no sign of it until to-day, when half a dozen specimens, all in rather poor condition, were taken. The species was practically over, and I was very unlucky in missing it while it was in its first beauty. At the highest point of the long day's climb *Parnassius mnemosyne*, also quite worn out, was flying. Other insects taken were *Satyrus hermione*, *Pieris manni*, *Melanargia galatea*, var. *procida*, *Chrysophanus hippothoe*, *Spilothyrus lavatera*, and a *Melitæa*, which I hoped would prove to be *M. dictynnoides*, but which the Rev. G. Wheeler, who has very kindly looked through my Balkan *Melitæas*, believes to be *M. athalia*.

The morning of July 10th was devoted to the exploration of a valley on the south-east side of the Narenta, below Jablanica. In the meadows near the bridge which carries the railway over the river *C. edusa* was flying. The hillsides hereabouts were as bare and lacking in shelter as the previous day's climb had been shady, there being very few trees or bushes. My notes show that the most abundant butterfly was *L. sinapis*, but the insects which were the most successful in making their presence known were undoubtedly the cicadas which abound in these valleys, and whose stridulations are sometimes almost deafening. I climbed to a ridge where a few young trees were growing, and here I found *S. hermione* in considerable numbers, sitting on the tree trunks, and, when disturbed, flying to a similar resting place a few yards away. *P. machaon* was racing up and down the mountain slope, but it was too hot to chase it, even if I had wanted to. *Zygæna carniolica* was common, resting upon the wild sage, and in looking at them I disturbed a butterfly which proved to be a male *Epinephele lycaon*. The species was evidently just emerging, and I only succeeded in finding two other specimens, all of the same sex. In the afternoon I again visited the railway banks to the north of Jablanica, where I had found *C. alciphron* and *A. daphne* so plentiful in June, but everything was now very different. Although the clumps of dwarf elder were still in flower, both butterflies were wanting or only represented by one or two dilapidated specimens. Vegetation in the valley had been burned up by the scorching rays of the midsummer sun, and as there were no lepidoptera to be found I



amused myself watching the cicadas on the tree trunks, and securing a few specimens as mementos of the occasion. On the following day I returned to Gravosa *en route* for England.

(To be continued.)

## A NOTE ON TWO SPECIES OF BASSID ICHNEUMONIDÆ PARASITIC ON A SPECIES OF SYRPHID LARVA.

BY A. E. CAMERON, M.A., B.Sc.

IN the course of my investigations into the Insect Fauna of the Soil, at the Experimental Laboratory of the Zoological Department of the University of Manchester, on which I am at present engaged, I collected in the beginning of April of last year a number of Syrphid pupæ with a view to rearing the imagines. As a general rule, the pupæ were found lying on the surface of the ground covered over by decaying cut grass, but several were obtained buried in the surface soil to a depth of two to three inches, the full-grown larvæ having evidently entered there to pupate. All the pupæ, along with some earth, were transferred to a glass jar, care being taken to keep the conditions fairly moist in order to prevent desiccation. On May 8th a small species of ichneumon was observed flying about within the muslin-covered jar, and an examination showed that one of the pupa-cases was empty, being pierced by a small circular aperture at the broad end. The adult ichneumon, which had evidently emerged from the empty Syrphid pupa-case, was identified by Mr. Claude Morley as *Homocidus dimidiatus*, Schr. (male). Owing to some inexplicable cause my endeavours to rear the adult Syrphid signally failed on this occasion, but recently I have been more fortunate in attaining this object.

On October 7th last I was successful in obtaining a large number of the larvæ of this same Syrphid. In the middle of January they began to pupate, much earlier, indeed, than would happen under natural conditions in the open, this being accounted for by the quickening influence of the higher temperature of the laboratory where the larvæ were kept (62° F.). The first adult of this lot appeared on February 3rd, followed by others later, and on February 5th I had the satisfaction of finding another specimen of *H. dimidiatus* (female), which had emerged from one of the pupa-cases.

A specimen of the adult Syrphid was examined by Mr. F. E. Edwards, of the Natural History Museum, South Kensington, and he diagnosed it as *Platycheirus albimanus*, Fab. (female).

*H. dimidiatus* belongs to the subfamily Tryphoninæ and the tribe Bassides. Morley, in his 'British Ichneumons,' vol. iv.

p. 103, notes it as occurring abundantly both on the Continent and in Britain; and, further, he there suggests, from the habits of allied species, that it may prey upon Syrphid larvæ. The following extract from his description of the species may be of interest:—"We know nothing of its economy, though that it preys upon Syrphid larvæ is rendered probable by my capture of a female on 28th June, 1903, investigating the green and unopened buds of *Heracleum*, covered with *Aphis hieracii*, Kalt."

The periods of occurrence of the Syrphid and its parasite as adults practically coincide, both being on the wing from May to September. The Syrphid is double-brooded, the insect hibernating in the larval state, pupating in March, and the adults emerging in the beginning of May. The eggs laid by this generation give rise to the adults which are seen on the wing in September, the summer brood passing through its development much more rapidly than the winter one. The larvæ which hatch from the eggs of this second generation of flies are those which hibernate, and from their pupæ the adults of late spring and early summer emerge. On making investigations as to the food of the larvæ of *P. albimanus*, I found that they were preying upon *Pterocallis tilie*, Linn., a species of *Aphis* infesting the lime-trees (*Tilia grandiflora*, Ehrhart) in the grounds attached to the Experimental Laboratory.

In addition to *H. dimidiatus*, I also succeeded in rearing another species of this genus, the host being the same as in the previous case (*P. albimanus*). This latter was identified by Mr. Morley as being *Homocidus tarsatorius*, Panz. The date of its emergence from the parasitized pupa was Sept. 12th, 1912.

## ON WALKER'S JAPANESE ICHNEUMONIDÆ.

By CLAUDE MORLEY, F.Z.S.

IN "Descriptions of some Japanese Hymenoptera, by Francis Walker, Esq." ('Cistula Entomologica,' i. 1874, pp. 301-310), twenty-two species of Parasitica and two Cynipidæ are shortly and quite inadequately diagnosed as new by its author, excepting one, of which he states the alternate sex had been brought forward by Fred. Smith during the same year in his 'Descriptions of New Species of Tenthredinidæ, Ichneumonidæ, Chrysididæ, Formicidæ, &c., of Japan.' No more definite localities are indicated than Japan. I shall here try to throw some light upon the systematic position of these insects, which have hitherto been but an incumbrance to our catalogues, though the discoloured state and the deplorable setting of the specimens, which were doubtless first preserved in spirit, greatly hamper such an attempt, since they are all gummed (often over their very

bodies) upon dirty cards, sideways, with both wings tightly fastened down in such a manner as to render the metanotal structure and often that of the abdomen invisible.

#### ICHNEUMONIDÆ.

1. *ICHNEUMON ALBIDIPES* (p. 302, ♂).—A male of the Cryptid genus *Goryphus*, Holmgr., 1868 = *Melcha*, Cam., 1899, and most closely related to *G. reticulatus*, Cam. ('*Spolia Zeylanica*,' 1905, p. 108. ♂). Black, with the face, except a narrow central line, apex of scape beneath, apices of first and second segments, and part of legs white; antennæ fractæ, areolet pentagonal, emitting recurrent nervure from its centre; nervellus indefinitely intercepted at its extreme bottom; length, 6 mm. One specimen.

2. *I. DIVERSIPES* (p. 302, ♂).—The male of a true *Cryptus* (*sensu* Thoms.). It is the front of the head and not the frons which is whitish, though the latter is narrowly concolorous on either side, as are the mandibles centrally; both metanotal transcarinæ are strong, and there is no "slight longitudinal furrow"; the second and third segments are dull, and doubtless discoloured, red; anterior legs piceous, with part of front ones paler; wings probably hyaline in nature; areolet small, subquadrate, and higher than broad; antennæ fractæ; length, 8 mm. One specimen.

3. *I. LANCEOLATUS* (p. 302, ♂).—A male of some Phæogenid; the metathoracic spiracles are small and quite circular; probably an *Ischnus*, on account of its deeply impressed and elongate notauli and strongly compressed anus. Antennæ fractæ; "the hind borders of the segments luteous" means that the three basal ones are apically red, and the seventh and most of the eighth are indefinitely white; not only are the hind tibiæ conspicuously white at their base, but their second to fourth tarsal joints are also white; the wings are doubtless discoloured; the areolet is large, weak, and subparallel-sided; length, 6½ mm. One specimen.

4. *I. INSOLITUS* (p. 302; ♀ only, ♂ lost).—This is *Cratichneumon annulator*, F., ab. female, or a very closely allied species, with the white hind tibial band nearly entire and close, though not quite extending to the base; scopolæ wanting; length, 6 mm. One specimen.

5. *ISCHNOCERUS BICINCTUS* (p. 303, ♀).—Type lost.

6. *CRYPTUS VARIATOR* (p. 303, ♀).—Very like a red Indian Cryptid of my acquaintance of the genus *Aritranis*, with head, pro- and mesothorax, second segment before its apex, third to fifth entirely, and the hind legs except their femoral base, black; antennæ black and slender, centrally white-banded, basally attenuate and apically fractæ; metathoracic spiracles small and circular, basal transcarina and apophyses wanting; terebra



nearly half abdominal length, with valvulæ apically explanate; length, 8 mm. One specimen.

7. *C. MACULIPES* (p. 304, ♀; cf. Smith, Trans. Ent. Soc. 1874, p. 393, ♀).—"The male is described by Mr. Smith," says Walker; but Smith described the female only, and the latter's type in the British Museum belongs to that sex, and is, moreover, generically distinct from either of Walker's females, which are certainly not co-specific!  $\alpha$  is apparently a female *Trichocryptus*, though the metanotal areola is obsolete; it is black, with its face (nearly concealed by the card) entirely whitish, as are the anus and flagellar band; the front legs may be partly pale; terebra nearly half abdominal length; notauli obsolete; areolet weak and subquadrate; length, 6 mm.  $\beta$  is much stouter, though similarly white-marked, but with the face entirely black; length, 8 mm.; it is probably a *Cratocryptus*, but is too greasy to allow of an adequate examination. Two specimens, both with small and circular metathoracic spiracles.

8. *MESOSTENUS LATICINCTUS* (p. 304, ♂).—*Exolytus levigatus*, Grav., ♂. The "Var. B. Hind femora black, except at the base" is another male of this variable species. Four specimens.

9. *GLYPTA ALBICOXA* (p. 304, ♀).—So far from being "nearly allied to *G. ceratitidis*" (*sic*), this is a typical specimen of *Clistopyga incitator*, Fab., female, with pale hind coxæ, determinately white-banded hind tibiæ, and terebra (probably broken) unusually short; length, nearly 6 mm. One specimen.

10. *LISSONOTA SEMISTRIATA* (p. 305, ♀).—One of the Agathid Braconidæ, extremely closely allied to, if not synonymous with, *Farinus gloriatorius*, Panz., female, with the Rev. T. A. Marshall's account of which it agrees in every way except in its very great size of 6 mm., with the terebra slightly longer than whole body. One specimen.

11. *MACRUS APICIFER* (p. 305, ♀).—A typical *Syzeuctus*, with elongate metathoracic spiracles; black, with the legs, except hind coxæ and base of their trochanters, pale; four basal abdominal segments red, with their apices, apical declivity of metathorax, and (apparently) scutellum flavidous; metapleuræ with no carinæ; cubital cell apically infumate; areolet minute and not as long as its petiole; terebra 7, and body, 10 mm. in length. It is none of the known Indian species of *Lissonotina*. One specimen.

12. *ECTHRUS ATRATOR* (p. 306, ♀).—A remarkable black Cryptid with only the flagellum partly and anus discally white; areolet pentagonal; abdomen petiolate, terebra as long as the abdomen; it has the facies of *Pristomerus*, though with no femoral tooth. Head very finely shagreened, discally subquadrate, with buccate cheeks; prominent and internally parallel eyes; antennæ fractæ, with flagellum partly pure white; notauli



deeply impressed and discally coalescent; scutellum deplanate and somewhat small; metathoracic areae apparently obsolete, though the apical transcarina is strong, spiracles circular and very small, lateral carinae distinct; petiole shagreened, centrally subsulcate and gradually explanate throughout; terebra a little reflexed; legs slender and not short, with pulvilli small and claws somewhat elongate; length, 7 mm. I would suggest a position for it near the Cryptid genus *Cecidonomus*, Bridg. One specimen.

13. *MESOLEPTUS STYGIUS* (p. 306, ♂). — The subquadrate vertex places this greasy male in *Perilissus*. The areolet is entire, the legs unusually slender, and the abdomen has, I think, once been centrally red; length,  $7\frac{1}{2}$  mm. One specimen.

14. *CAMPOPLEX ALBIMANUS* (p. 306, ♂). — A typical *Nematomodius*—just possibly *N. linearis*, Grav.—with small, rectangular, and slightly transverse areolet, emitting recurrent nervure a little beyond its centre; mesopleurae distinctly sulcate below, and both flagellum and hind tarsi white-banded, and clypeus wholly concolorous; the thorax and abdomen bear a coating which may once have been elongate pilosity; both metanotal transcarinae are entire; spiracles strongly elongate; length, 11 mm. One specimen.

15. *SAGARITIS VENTRALIS* (p. 307, ♀). — A Campoplegid, too smothered in gum to determine. Antennae fractae; areolet entire and petiolate; terebra shorter than breadth of anus dorso-ventrally, and much less than basal segment; areola deeply impressed and confluent with petiolar area, as in *Limnerium*, though the terebra is too short for that genus or *Omorga*; the third and following segments appear to be ochraceous, with only a discal vitta black; the coxae are normal; length about 6 mm. Two specimens; and a third, belonging to ? *Eriborus*, with terebra longer than half abdomen and no areolet.

16. *CHAROPS LUTEIPES* (p. 307, ♀). — Type lost. Very improbably placed in its correct genus, for Walker's *Porizon dominans* (Ann. Nat. Hist. 3, v. 1860, p. 307) is a typical *Charops*—cf. 'Fauna of India,' i. 1913, p. 435.

#### BRACONIDÆ.

17. *BRACON SEMILUTEUS* (p. 307, ♀). — Quite certainly synonymous with *B. piger*, Wesm. One specimen.

18. *SPATHIUS FASCIATUS* (p. 307, ♀). — Superficially indistinguishable from *S. exarator*, Linn. One specimen.

19. *HECABOLUS CINCTUS* (p. 308, ♂). — Certainly belongs to Marshall's Braconides-cyclostomes, not a Bracon, and perhaps *Ihecabolus*: I know nothing like it. One specimen.

20. *CHELONUS DIVERSUS* (p. 308, ♂). — A beautiful species of

*Phanerotoma*, Wesm., with the abdominal carapace trisected and the intermediate tibiæ a little sinuate. One specimen.

21. *PROTEROPS BASALIS* (p. 308, ♀; *sic* ♂).—The type appears to belong to the genus *Cardiochiles*, Nees, on account of its distinct cubital areolet and deeply impressed notauli of the black mesonotum. One female specimen.

#### PROCTOTRYPIDÆ.

22. *EPYRIS CRASSICORNIS* (p. 309, ♀).—Type lost.

#### CYNIPIDÆ.

23. *RHODITES JAPONICA* (p. 309, ♀). — A true female of *Rhodites*. One specimen.

24. *SYNERGUS JAPONICUS* (p. 309, ♀). — A true female of *Synergus*. One specimen.

### NEW BUTTERFLIES FROM NIAS.

BY PERCY I. LATHY, F.Z.S., F.E.S.

(Concluded from p. 101.)

#### *Eulacura bipupillata*, sp. nov.

♀. Upper side. Fore wing yellowish brown, a wide, irregular, diffused, whitish band beyond cell, an obscure preapical light spot; base of costa, a bar within, and a fascia beyond cell slightly paler than ground colour, two black spots, of which the lower is the larger, between upper and lower median nervules; beyond these spots some indistinct pale lunules. Hind wing brown, a discal yellowish brown band crossing wings at end of cell, the upper part of this band whitish, beyond a series of blackish markings, the upper ones sagittate, the lower circular, all edged with pale yellowish brown, a dark submarginal line.

Under side. Fore wing pale lilac-brown, a pale brown bar within, and another at end of, cell, an irregular dark line sharply angled on median nervure crossing disc, the area beyond diffused with whitish, black spots as above, but blue-centred, and ringed with yellowish brown, an obscure submarginal dark line. Hind wing pale lilac-brown, a dark spot within cell, discal line of fore wing continued to inner margin above anal angle, this line outwardly edged with bluish white diffused on upper half, a submarginal series of more or less sagittate bluish white lunules, two blue-centred yellowish-ringed black spots between upper and lower median nervules; of these the lower is much the larger.

Four female specimens in Coll. Adams. This species may easily be separated from *E. osteria*, Westw., as it has two ocelli between the median nervules on both wings below.

*Apatura rufiveneta*, sp. nov.

♂. Upper side. Fore wing blackish brown with the following obscure reddish brown markings: three bars within cell, an irregular discal band and a marginal line, five preapical white spots, an oval, reddish-ringed black spot between middle and lower median nervules. Hind wing blackish brown, with following obscure reddish brown markings: a bar within cell and discal, submarginal, and marginal bands, the latter enclosing a fine black line, a black spot, widely ringed with red, near anal angle.

Under side. Fore wing yellowish brown, three black spots within, and a double black bar at end of cell, an obscure discal pale band, becoming whitish on inner margin, white spots as above but edged black, red-ringed black spot between median nervules more conspicuous than above, an irregular submarginal brown band and fine black line beyond. Hind wing yellowish brown, two black spots within, and double black line at end of cell, traces of a discal pale band, a submarginal sagittate brown line, and fine black line beyond red-ringed black spot as above.

This is the Nias representative of *A. parisatis*, Westw., from which, however, it may be easily distinguished by conspicuous red spot at anal angle of hind wing above; in this respect it resembles *A. rha*, Feld., from the Philippines, but from that species it differs in the very different colour of the under side. Apparently a rare species. I have seen only two specimens; both are in the Adams Collection.

*Eulepis kenneqeteri*, sp. nov.

♂. Upper side. Fore wing black, a wide pale yellow band from upper median nervule to inner margin, a pale yellow spot between this band and apex. Hind wing black, a wide pale yellow band from middle of costa, narrowing to a point near anal angle, submarginal row of white spots, a yellowish bar at anal angle.

Under side. Fore wing with yellow markings as above, base and costa broadly lilac-brown, a black spot within, and a black bar at end of cell, a black line inwardly narrowly edged with white extending from apex of cell to lower median nervule; the pale yellow area, which is inwardly edged black, is surrounded by a chocolate-brown border very narrow and becoming blackish on its outer edge, beyond this a series of blackish lunules filled in with lilac, and set in a pale lilac band, a twin black patch below lunules, outer margin widely greenish brown. Hind wing with yellow markings as above, edged outwardly and inwardly with bright chocolate-brown, a subbasal black line, inwardly edged with white, extending from costa to just below median nervule, another black line from costa to base of lower median nervule edging the yellow area, base and inner margin lilac-brown, beyond the pale area a series of reddish silver-edged lunules surrounded by blackish, but no trace of red in lunules between upper and lower median nervules, a black line outwardly edged with white from lower median nervule to inner margin; outer margin widely greenish brown with a submarginal series of white spots edged outwardly with black, and a marginal series of yellowish bars.

This is the Nias form of *Eulepis athamas*, Dru., and appears to be rare. Mr. Adams has eight examples, and I cannot find any previous record of it from Nias. It may be distinguished from the other races of *athamas*, Dru., by the greater extent of the black on the under side, the subterminal patch on fore wing being much larger, and there is not the slightest trace of red in the lunules between upper and lower median nervules on hind wing.

*Charaxes vandepolli*, sp. nov.

♂. Upper side. Fore wing chestnut-brown, a wide white band from just below costa to submedian nervule, beyond this band black; a blackish spot at end of cell and two black bars between upper and lower median nervules. Hind wing chestnut-brown, paler on costa, a wavy dark line from centre of costal to subcostal nervule, a submarginal row of white-pointed black spots, of which the two upper are fused into a large patch, a small greenish patch at anal angle and the two black spots here have some bluish scaling.

Under side. Fore wing brown with a slight lilac tinge, paler on the outer margin, inner margin whitish; the following black markings: a spot at base, three irregular lines within, and a twin bar at end of cell, a line from base of middle median and lower median nervule and a line below this nearer base, two highly irregular discal lines, the inner outwardly edged with whitish, and both with diffused ochreous; interspace between cellular lines paler than ground colour, outer margin greenish bordered inwardly with a narrow silvery band, two obscure subapical greenish patches. Hind wing brown, with a slight lilac tinge, a black bar at base, two irregular subbasal black lines, the space they enclose being paler than ground colour, and the outer line inwardly edged with whitish, discal lines and edging similar to fore wing; a wide lunular dark band from apex to anal angle, where it narrows to a point; a submarginal series of small black spots, surrounded by bluish, green, and white scaling, and a whitish spot behind each; outer margin ochreous, and a fine marginal rich brown line.

This is a very distinct species, somewhat resembling the female of *C. psaphon*, Westw. The only other island form of this group of *Charaxes* that I know in which the male has a discal pale band is *C. borneensis*, Butl., from Sumatra and Borneo; that species has, however, a very dark under side with no ochreous markings, has also a much narrower discal band, and much shorter tails. I only know of the specimen here described.

*Charaxes mitschkei*, sp. nov.

♂. Upper side. Fore wing chestnut-brown, a twin black spot at upper end of cell, apical third black. Hind wing chestnut-brown, with submarginal row of black lunules inwardly edged with yellowish the two at anal angle being white and having bluish scaling; an apical black patch containing two whitish spots.

Under side. Fore wing shining brown, with a faint lilac tinge



beyond disc yellowish green; the following more or less irregular black lines: three within, and a double one closing cell, the third from base within cell being continued to near submedian nervule, two beyond cell from near costa to submedian; some obscure sub-apical brownish spots and an obscure submarginal line of the same colour. Hind wing with ground colour as in fore wing; four irregular black lines crossing wing, of which the outer is the most distinct; a faint double black line closing cell: some postdiscal obscure brown lunules and a submarginal line of a similar colour; a submarginal series of white spots, all of which, excepting the two upper ones, are outwardly edged first with pale blue, then black.

This species may be distinguished from *C. fervens*, Butl., by its much smaller size, the former averaging 96 mm., while the new species averages 76 mm. The ground colour of the under side of *C. fervens* is different, being much redder, and the linear black markings are edged with white, this not being so in *C. mitschkei*; from *C. enganicus*, Fruhs., to which it appears to me to be the nearest, it may be separated by the outer black line of both wings below being quite well defined, and the blue-edged spots of hind wing below smaller.

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## ORTHOPTERA IN 1912. (SUPPLEMENTARY LIST.)

By W. J. LUCAS, B.A., F.E.S.

MR. F. W. FROHAWK has given me a few earwigs (*Forficula auricularia*) which he captured in the Scilly Islands under pieces of rock in October, 1912. Though they were not picked specimens, most were large, one or two being var. *forcipata*. A rather large male had one branch of its callipers extremely short and bent downwards, the other being about normal.

Mr. B. S. Harwood sent me the following short list for 1912. *Forficula auricularia* var. *forcipata* and near it. *F. lesnei*, obtained at Colchester by beating. *Ectobius panzeri*, at Clacton-on-Sea in August. *Ectobius perspicillaris* (= *livida*), one taken by his brother at Bournemouth. *Gryllus domesticus*, in a bake-house at Colchester. *Nemobius sylvestris*, taken by his brother in the New Forest in October. *Leptophyes punctatissimus*, several at Colchester by beating various trees in August and September. *Meconema thalassinum*, not uncommon at Colchester by beating various trees in August and September. *Conocephalus dorsalis*, North Essex coast, September 7th, several, both male and female. *Phasgonura viridissima*, two or three in damp meadows at Colchester in August. *Pholidoptera griseo-aptera* (= *cinereus*), at Colchester on nettles, &c., till well on into October: nymphs in June and July. *Metrioptera albopunctata* (= *grisea*), two at Colchester on restharrow in August. *Metrioptera roeselii*, at Colchester; nymphs noticed on June 24th; four female imagines

captured September 7th. *Gomphocerus maculatus*, at Clacton-on-Sea in August. *Stauroderus bicolor*, abundant at Colchester. *Chorthippus elegans*, rather common on sea-walls at Colchester on September 7th. *Chorthippus parallelus*, not uncommon at Colchester in dry fields. Mr. Harwood was good enough to send the *E. perspicillaris* and some of the *F. auricularia* for inspection. I usually expect *C. parallelus* to be more frequent on damp than on dry ground.

Kingston-on-Thames: March, 1913.

## NOTES AND OBSERVATIONS.

HYBERNATION OF PYRAMEIS ATALANTA.—Referring to the note on this subject by Mr. F. W. Frohawk in the February number of the 'Entomologist' (vol. xvi. pp. 40-42), perhaps it may be worth putting on record in the same journal that amongst my notes on the Lepidoptera of Northumberland and the Borders, which I have lately been going over with a view to publication, there is one of a red admiral which I found hibernating in a potting-shed in our garden in Berwick-on-Tweed, in December, 1887. It was alive when discovered, and in such fair condition that it made quite a passable cabinet specimen. The sex does not appear to have been noted. In addition to this instance I have a note of one found hibernating by the late William Shaw, of Elymouth, in Berwickshire, a few years previously, and, although I forget now what became of the specimen, and have no more details of it, he was a most careful entomologist and a man whose statements could always be implicitly relied upon. We were not aware at that date that the hibernation of this species was so exceptional in this country as it appears to be considered now, else, no doubt, fuller particulars would have been preserved, and possibly other instances noted.—GEORGE BOLAM; Alston, Cumberland.

EREBIA EPIPHRON (var. CASSIOPE) AT "MALVERN."—In the Oberthür collection at Rennes there are fifteen specimens of *epiphron* (var. *cassiope*) purchased at the sale of the Raynor collection at Stevens's Auction Rooms, October 27th, 1891. Some of them are labelled "Malvern." Can any reader of the 'Entomologist' throw light on the origin of these butterflies, or refer me to any account of the occurrence of the species in Worcestershire?—H. ROWLAND-BROWN; Harrow Weald, March 10th, 1913.

CENONYMPHA TIPHON AND PAMPHILUS ON THE SAME GROUND.—In his interesting article describing the rediscovery of *Cenonympha tiphon* in North Wales Mr. Arkle concludes with an observation which seems intended to invite a confirmation, or the contrary, from the experience of other collectors. I refer to the remark, "I have no recollection of seeing *pamphilus* on exactly the same ground as *tiphon*, whatever the character of the locality might be." My own experience of *tiphon* is so small as to be confined to only two localities, and both these Continental. But, oddly enough, in both

these places, *viz.* the Weesen Marshes, in Switzerland, and at St. Maurice sur Moselle, in France, I took *pamphilus* flying on the very same ground as *tiphon*. Indeed, at Weesen I sometimes made an unnecessary capture of *pamphilus* female in mistake for *tiphon*, as the former species is often exceptionally large in this locality. Very probably, had I had opportunity of hunting *tiphon* in as many and varied haunts as Mr. Arkle, it would have struck me also with surprise to see the two butterflies on the same ground. What seems to be remarkable is that in these two places, so wide apart, and the only localities where I have come across *tiphon*, I found its congener too. May a possible explanation be that, though *pamphilus* can be comfortable in the lowest or driest of *tiphon*'s habitats, when the latter occurs at higher elevations, or in very wet places, the smaller cœnonymph is absent?—(Rev.) FRANK E. LOWE; Guernsey, March 7th.

EARLY EMERGENCES OF *PLUSIA GAMMA* AND *DEMAS CORYLI*.—It may be of interest to record the emergence of *Plusia gamma* on January 17th. The pupa was spun up in an outdoor cage fully exposed on an outdoor wall facing east. The larva was taken in October last under some plants of *Chenopodium*; and although there are several other pupæ of *P. gamma* in the same cage, this is the only one which has emerged. I have also had a male specimen of *Demas coryli* emerge, but the cage this pupa was kept in was indoors, so perhaps this emergence is not so remarkable as that of *P. gamma*.—B. L. WILLIAMS; 77, Durham Road, East Finchley, N., February 17th, 1913.

EUCOSMIA UNULATA AT CARLISLE.—I captured a single specimen of this moth at Orton, near here, on June 22nd last. It was flying about 6 p.m. among some young firs. I know of no previous record from this district. Dawson does not mention it in his list, while Mawson gives it as "rare" in his West Cumberland list.—JAS. MURRAY; 2, Balfour Road, Carlisle.

HYBERNIA MARGINARIA FUSCATA AT CAMBRIDGE.—On Friday last, March 7th, 1913, I captured a perfect male specimen of *Hybernia marginaria* var. *fuscata* on a street lamp near the river at Cambridge. Is not this occurrence rather unusual for this part of England?—A. CAPEL MORRIS; Leafield, Gibson's Hill, Norwood, S.E.

LEUCOPHASIA SINAPIS IN SUSSEX.—I was stopping at a little village called Northchapel, Sussex, halfway between Haslemere and Petworth, on May 11th last, and with my friend, Mr. J. Dunnett, went out before breakfast, taking the nets with us, as it was a wonderfully fine morning; and in a glade between the oak woods, between 8.30 and 9.30, we caught six males and three females of *L. sinapis*, all in perfect condition, evidently having come out of chrysalis the same morning.—J. H. VICKERS; Holywood, Bulstrode Road, Heston, Hounslow.

ENTOMOLOGICAL CLUB.—A meeting was held on March 18th, 1913, at 58, Kensington Mansions, S.W., Mr. Horace Donisthorpe in the chair. The other members present were Messrs. Adkin, Hall,

Porritt, Rowland-Brown, Sieh, and Collin (Honorary). Among the visitors were the Rev. F. D. Morice and Messrs. Durrant, Gahan, and Step.—RICHARD SOUTH (*Hon. Sec.*).

## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Dec. 12th, 1912.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Ashdown exhibited a collection of over one hundred species of attractive Coleoptera obtained by him in Switzerland in June and July, 1911 and 1912, including *Cerambyx cerdo*, *C. scopoli*, *Saperda scalaris*, *Trichius fasciatus*, &c.—Mr. Tonge, very dark *Noctua xanthographa* from Deal, at sugar, and a bred series of *Cirrhia citrargo* from Dorking.—Mr. South, for Rev. W. Claxton, a series of *Tortrix pronubana* from Bournemouth, among which was a specimen identical with the *ambustana* of Hübner—it was the only one of the form reared; also a form of *Olethreutes ochroleucana* from near Romford, with the apical third of fore wing greyish, enclosing dusky cloud-like markings almost parallel with the termen.—Mr. Kaye, three Syntomid moths, *Oreynia carcarata* from Caracas, mimicking a wasp; *O. tarsalis* from British Guiana, mimicking a fossorial wasp; and *Trichura cerberus*, male, with long anal projection, mimicking an ichneumon female with long ovipositor. The resemblances were most pronounced.—Mr. Grosvenor, series of *Melitæa aurinia* from more than a dozen British localities, to show the geographical variation.—Mr. Hy. J. Turner, a series of under sides of *Argynnis adippe*, to show the variation obtainable on the Continent, including ab. *cleodora*, var. *chlorodippe*, var. *cleodippe* (the two last Spanish), ab. *bajuvatica*, ab. *ornatissima*, var. *norvegica*, &c.—Mr. Newman, very varied forms of *Agrotis cursoria* from Shetland.—Mr. Main, larvæ of *Clythra quadripunctata* in their cases of excrement, taken by Mr. Donisthorpe from a nest of the ant *Formica rufa*.

*January 9th, 1913.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. F. H. Stållman, of Dulwich, was elected a member.—Mr. R. Adkin exhibited three specimens of *Papilio machaon* reared from Norfolk larvæ, having the whole of the lunules on the outer margin of the hind wings more or less strongly orange.—Mr. Newman, a living female *Selenia bilunaria* bred out of doors on January 9th, the first of the brood emerged on December 20th. He also showed sprays of alder and buckthorn in leaf.—Mr. Rayward, the working of *Egeria andrenæformis* in *Viburnum*, and a similar working in elder, which had all the characteristics of that of *Æ. andrenæformis*.—Mr. Tonge, several species of butterflies from Redlands, California.—Mr. Gahan read a paper on "Mimicry in Coleoptera," and illustrated it with a large number of particularly mimetic species.

*January 23rd.—Annual Meeting.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—The Reports of the Council and Officers for the past year were read and adopted, and the President read the Annual Address in which, after discussing the affairs of the Society and reviewing the entomological happenings for the year, he sum-



marised his own work in the study of the ova and early stages of the Lepidoptera.

The following is a list of the Officers and Council elected to serve for the ensuing year:—President, A. E. Tonge, F.E.S.; Vice-Presidents, W. J. Kaye, F.E.S. and B. H. Smith, B.A., F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dods; Curator, W. West; Hon. Secretaries, Stanley Edwards, F.L.S., and Hy. J. Turner, F.E.S.; Council, R. Adkin, F.E.S., C. W. Colthrup, T. W. Cowham, A. E. Gibbs, F.L.S., A. Russell, F.E.S., W. G. Sheldon, F.E.S., and A. Sieh, F.E.S.—Votes of thanks were passed to the President and other Officers.—*Special Meeting*.—It was unanimously agreed to appoint an Editor of 'Proceedings' as an additional Officer and to increase the number of the Council from seven to nine. The new rules to take effect as from January 1st, 1913.—*Ordinary Meeting*.—Mr. Buckstone exhibited several short series of bred *Phragmatobia fuliginosa*, representing second and third broods from Aberdeen, first brood from Horsley, and second brood from Wendover.—Mr. Bacot, an enlarged photograph of an Indian flea, reputed to be one of the carriers of plague.—Mr. Dunster, specimens of *Dicycla oo*, *Mellinia ocellaris* and *Miselia oxyacanthæ* from Winchmore Hill.

*February 13th*.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. C. R. Wixcey, of Palmer's Green, N., was elected a member.—It was announced that Mr. Step had been made Editor of 'Proceedings,' and that Messrs. J. Platt Barrett and N. D. Riley were added to the Council, in accordance with the alterations in the bye-laws passed at the Special Meeting held on January 23rd.—Mr. Buckstone exhibited several aberrations of *Charæas graminis*, including a remarkably uniform grey specimen, the markings being scarcely discernible.—Mr. West, six species of the coleopterous genus *Ophonus* (*Harpalus* in part), with the ædeagus mounted by the side of the males, and remarked that the study of this organ had revolutionized the previous identification of the species.—Mr. Andrews, a series of the Dipteron *Hematobia irritans*, taken off the backs of bullocks near Milford Haven. Around the horns, clustered in dense rings, flies had frequently been noticed.—Mr. K. G. Blair, a large, living larva of a *Geotrupes* sp. (dung beetle) and compared it with that of *Melolontha*.—Mr. A. E. Gibbs, a large number of Syntomidæ, with their supposed models, taken by Dr. Davis, of Belize, in British Honduras.—Mr. Tonge, a fine bred series of *Epinida lichenea*, from Eastbourne.—Mr. Coote, bred *Papilio machaon*, in which the ground colour approached that of ab. *aurantiaca*.—Mr. Frohawk, various aberrations of *Melitæa athalia*, *M. aurinia* and *M. cinxia*, including a fine melanice form of the first species and some fine under side forms of the last-named, together with drawings of an albino *Argynnis adippe*, an albino *Euchloë cardamines*, &c.—The rest of the evening was devoted to microscopical exhibits by Messrs. C. B. Williams, R. Adkin, F. Noad Clark, Ashdown, and W. West (Ashstead).—HY. J. TURNER (*Hon. Rep. Sec.*).

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquh Street, Liverpool, Monday, January 20th, 1913, Mr. R. Wilding, Vice-President, in the chair.—

A paper by Mr. H. St. J. K. Donisthorpe, entitled "Some Associations between Ants of different Species," was read by the Hon. Sec. The paper fully described all that is known of these associations, and specially dealt with the relationship between species of *Formicorenus*, *Anergates*, and *Wheeleriella*. A vote of thanks to the author was carried unanimously, and a discussion, showing a general interest in the subject, ensued. Exhibits were as follows:—A box of Micro-Lepidoptera by Mr. A. W. Boyd, collected in Lancashire and Cheshire during 1912, recording many new localities for species already on our list.—Mr. W. Mansbridge showed a buff male of *Arctia mendica* from Co. Cork.—WM. MANSBRIDGE, *Hon. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—Meeting held in the Manchester Museum on Wednesday, December 4th, 1912, Mr. W. Buckley in the chair.—Mr. B. H. Crabtree exhibited *Aplecta nebulosa* from Argyll and the New Forest, and the three forms from Delamere.—Mr. J. H. Watson gave a lecture on "The Parnassiinae, an Ancient Group of Butterflies," which was illustrated by the exhibition of his collection. The headquarters of the family is in Tibet, which more nearly approaches the conditions of the glacial epoch than any other country. The family is a very ancient one, and an allied form is found as a Miocene fossil. Mr. Watson exhibited twenty-two out of thirty-two species recognized by Mr. Rothschild, and another (*P. delius*) which he considered should be raised to specific rank.

January 8th, 1913.—Mr. W. Buckley gave the Annual Presidential Address "On Collecting and Rearing *Aeidalia contiguaria*, some Personal Experiences." In the first place, he gave his experiences in the field in N. Wales, with the insect in all its stages. Then he referred to its breeding in captivity; 95% of the larvæ survive the winter if dried knot-grass be used for hybernation. Finally, he gave full details of his experiments in breeding the light and dark forms. After breeding for three generations from the wild insects he made the four different pairings possible between the light and dark forms, with the following results:—(i) Light ♀ × dark ♂. One brood of sixty-nine imagines had 68·7% dark and 31·2% light; another brood, 75% dark and 25% light—practically Mendelian proportions, the light form being the recessive. (ii) Dark ♀ × light ♂. Never fertile, though a number of pairings were made. (iii) Dark ♀ × dark ♂. All dark for two generations. (iv) Light ♀ × light ♂. All light.—Mr. J. H. Watson exhibited two *Parnassius apollo* from Mount Ararat and the Altai Mountains.—Mr. B. H. Crabtree showed canary-coloured specimens of *Pieris napi* bred from Donegal by Mr. Head, of Scarborough.—A. W. BOYD, M.A., *Hon. Sec.*

## RECENT LITERATURE.

*Psyllidarum Catalogus.* By Dr. G. AULMANN. Pp. 92. Berlin : W. Junk. 1913.

THIS is a synonymic catalogue of the Psyllidæ of the world, so far at least as these minute homopterous insects have been made known to science.

Of the four hundred and seventy-eight species listed, more than half belong to the Palaearctic Region. The Nearctic species number some eighty to eighty-five, in addition to several that are common to both Regions. The Oriental and Australian Regions together contribute about one hundred and twenty-five species. Only seventeen species are recorded from the Neotropical and Ethiopian Regions, seven from the former, and ten from the latter.

It is interesting to note that of the species occurring in Britain (about sixty in number) four—*Psylla colorata*, *P. löwii*, *P. picta*, and *P. venata*—have not been detected in any other part of the world; whilst thirty of the species inhabiting Japan appear to be confined to that country.

Reference to literature, especially concerning Palaearctic species, is full, and, in some cases, exhaustive. In the majority of instances the food-plants are mentioned, and there is an index to these as well as to the insects.

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*Diptera Danica. Genera and Species of Flies hitherto Found in Denmark.* By WILLIAM LUNDBECK. Part iv. Dolichopodidæ. Pp. 1-407. Text figures 130. Copenhagen: G. E. C. Gad. London: Wesley & Son. 1912.

THE author states that pending further necessary subdivision of the Dolichopodidæ by Becker, who is now working on the family, he has adopted the four subfamilies of the "Katalog d. paläarktischen Diptern." The one hundred and seventy-two species, in thirty-five genera, considered in the present volume are therefore grouped as follows:—i. Dolichopodinæ (9 genera, 81 species). ii. Diaphorinæ (4 genera, 22 species). iii. Rhabdiniæ (5 genera, 22 species). iv. Hydrophorinæ (17 genera, 47 species).

We note some synonymic changes, and one novelty—*Dolichopus varitibia*; the latter described from a male caught in Lyngby Mose in 1911, and the only known specimen.

Publication of this important work was commenced in 1907, and Parts ii and iii appeared in 1908 and 1910 respectively. All were duly noticed in the "Entomologist," but it may be again mentioned that the text is in English, and that the bulk of the species so far dealt with are to be found in the British Isles.

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*Fourteenth Report of the State Entomologist of Minnesota for the Years 1911 and 1912.* Eighth Report of F. L. WASHBURN. Pp. i-xiii and 1-114. Agricultural Experiment Station: St. Anthony Park, Minn. Dec. 1, 1912.

TREATS of Grasshoppers and other injurious insects and the methods adopted to destroy them or to control their depredations. In the case of Grasshoppers sodium arsenite spray has been found the most effective.

In addition to numerous illustrations in the text, three excellent plates in colour, representing specimens of some twenty species of Acridiidae taken in Minnesota, are issued with the Report. There is also a plate from a photograph, showing a small portion of a swarm of South African Locusts.







A. E. G. Photo.

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## THE LIFE-HISTORY OF *CÆNONYMPHA TIPHON*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

On July 21st, 1903, the late Mr. F. G. Cannon watched a female *C. tiphon* deposit a single egg on a dead stalk of beaked rush (*Rhynchospora alba*), which he kindly sent me; this hatched on August 5th, remaining fifteen days in the egg-state. He also sent me at the same time some live females from Witherslack; these deposited about six dozen eggs during the following week, mostly on the plant of beaked rush sent with them, which I potted up and placed them upon. Most of the eggs hatched during the second week of August.

I am also indebted to Mr. A. S. Tetley for several females which he captured for me on Whitby Moors, Yorkshire, on July 17th and 25th, 1909. These laid several eggs during the following weeks after their arrival, on the 19th and 28th respectively. One female deposited nine eggs in the chip-box during the journey. These laid during the end of the third week of July and hatched during the first week of August.

On June 15th, 1911, Mr. Frank Littlewood kindly sent me eight females, and four more on the 17th, which he captured near Kendal. These were accompanied with a note, saying: "The species must have been on the wing by June 1st, as everything is so forward with the hot weather."

These females I placed on growing plants of beaked rush, sent by Mr. Littlewood for the purpose. Altogether about two hundred eggs were laid during the latter part of June; these started hatching early in July, and by the end of the third week some of the larvæ had moulted once, owing to the continuous fine hot weather of that month; on the 21st and 22nd the shade temperature was as high as 92° and 93°.

On June 29th and 30th, 1912, I captured several females at Witherslack; those reserved for eggs laid freely during the first half of July.

The egg is large for the size of the butterfly, being  $\frac{3}{8}$  in. high, of an elliptic-spheroid form, with a swollen micropyle, which is very finely reticulated. The reticulations covering the

surface of the egg increase in size over the rest of the crown, developing into irregular longitudinal keels down the side, which disappear on rounding the base; these number about fifty altogether. The spaces between the keels are finely ribbed transversely. The colour when first laid is whitish ochreous-green, which gradually turns to a pale straw-yellow, and pale ochreous-brown spots appear under the shell, which gradually become more pronounced and form an irregular pattern of small blotches, and a more or less broken band forming an uneven zone. The shell then becomes opalescent, having a bluish reflection in the high light.

The egg is laid singly on the blade or stem of grass.

The larva escapes from the egg by eating away the shell in a line for about two-thirds of the circumference just below the crown; it then forces itself out, the crown acting like a lid.

Directly after emergence the larva measures  $\frac{1}{10}$  in. long. The body is slightly attenuated posteriorly, and strongly wrinkled transversely, each of the abdominal segments having six subdivisions, the first of each being the widest. There are five longitudinal dull amber-coloured lines, one medio-dorsal and two on each side, *i.e.* one subdorsal and one immediately above the spiracles; between these last two is a very fine and rather broken-up line of the same colour; the lateral ridge is somewhat whiter than the dorsal surface, which is a pale pearly ochreous; the ventral surface is rather darker ochreous. The anal points end in a short, slightly curved bristle. On the side of each segment are five minute dusky claw-like points, all projecting backwards, two between the dorsal lines, one just above the spiracle and two just below it; on the claspers, legs, and last three segments are simple white spines. The spiracles are dull olive-brown. The head is large and globular, light ochreous in colour, beset with tiny white points; eye-spots black.

The young larvæ refused to feed on the beaked rush, but on supplying them with *Poa annua* they at once started feeding, and continued feeding well upon it. They feed during daytime when young.

First moult, August 24th.

Before first moult, twelve days old, it measures  $\frac{1}{6}$  in. long; the ground colour is then greenish ochreous, but almost pure green over the greater part of the anterior half, due to the food showing through its semi-transparent body. The amber stripes of its earlier life are now of a darker hue, being drab, bordered below by a whitish line along the edge of the side stripes.

Before second moult it measures  $\frac{1}{4}$  in. long, ground colour green, with darker green medio-dorsal, subdorsal, and spiracular longitudinal stripes; the first is bordered on each side by a fine whitish line, the subdorsal is bordered above by a broader and more conspicuous whitish stripe, and bordered below by a darker

line than the ground colour; the spiracular stripe is bordered below by a conspicuous and comparatively broad white stripe. The head is pale yellow-green, granulated, and beset with minute black points; eye-spots black. The body is sprinkled with black claw-like points similar to the last stage.

Several moulted second time during first week of September, and entered into hybernation during the latter half of the month, resting on the basal stems of grass.

After second moult (after hybernation) about one hundred and ninety days old, it is  $\frac{2}{3}$  in. long, which is only a trifle longer than the previous stage, but a good deal stouter. Excepting the stripes, which are bolder, the colouring and pattern are the same as before moulting; the hook-like points are more developed.

On March 6th I examined plants upon which the larvæ hybernated, and found eighteen had survived the winter; a few of these were moving slowly about. The following day, being warm and sunny, I noticed three had crawled up the fine *Festuca* blades, and were eating the extreme tips in the sunshine. They continued feeding through March, usually during the morning when the sun had sufficiently warmed the temperature.

Most of the larvæ moulted third time during March. After third moult, nine months old, it measures  $\frac{1}{2}$  in. long. The whole colouring and markings are clearly defined; the head is clear green, granular, and sprinkled with minute white points; the body is likewise granular and studded with whitish warts, each bearing a thorn-like point.

In captivity they feed on various grasses, especially *Festuca*, which they always eat at the tip, gradually eating it down. In movements they are most sluggish, gliding along in a very slow, slug-like motion. Upon the slightest disturbance they fall from the plant.

On April 1st the first one fixed itself for the fourth and last moult.

After fourth and last moult, fully grown, it measures 1 in. long. It is rather slender and slightly attenuated anteriorly, and more so posteriorly. The head is globular, granulated, and covered with extremely minute hair-like points, which develop into whitish hairs in front. The segmental divisions of the body are ill-defined, and each with six subdivisions forming transverse wrinkles. The surface, like the head, is granular, and sprinkled all over with minute whitish warts, each bearing a very minute claw-like point.

The ground colour is grass-green, striped longitudinally with a very dark velvety green medio-dorsal band, palest at each end; this is bordered with a fine whitish line; a subdorsal white stripe tinged with lemon-yellow which terminates in the anal point; a subspiracular stripe rather whiter; all the stripes are equidistant. Between the subdorsal and subspiracular stripes



is a dark green subcutaneous irregular line; the anal points are rose-pink and white. The head is green, mouth-parts and eye-spots brownish; legs and claspers also green.

The first one spun up for pupation on May 10th, and pupated 6 a.m., May 13th, 1912.

Another larva suspended for pupation on May 28th, and pupated early a.m., May 30th, 1911. This specimen was found by Mr. F. Littlewood at night, May 18th, by searching near Kendal, who very kindly sent it direct to me.

The pupa greatly resembles *C. pamphilus*, but has the abdomen less curved and is rather larger. It measures  $\frac{7}{16}$  in. long, and is elegantly proportioned. Lateral view: head angular, thorax slightly keeled and swollen dorsally, abdomen tapering and rather swollen towards the base and curving to the anal segment, which terminates in a knobbed cremaster amply provided with a dense cluster of amber-coloured hooks, similar in construction to *C. pamphilus*. Ventral surface: the wings swollen near apex, the outline then slightly concaved to head. Dorsal view: head broad and truncated, angular at base of wings; abdomen swollen at middle, then tapering to anal extremity. The colour at first is a vivid translucent green over the head, thorax, and wings; abdomen yellowish green, which gradually becomes greener. After a day old to the end of the fourth day it is of a most intense, brilliant, clear emerald green, finely freckled with greenish-white very faint at first, which becomes more distinct after the fourth day. A dull olive-green streak runs along the inner margin of the wing, which forms a slight ridge bordered along the inner edge with a whitish streak; these streaks are continued in front of the head but broken through by the antennæ and eye; two other streaks run parallel with the nervures, one medium, the other near the apex. The tip of tongue is dark green, gradually fading away about the middle, a dusky green medio-thoracic longitudinal streak and a dull purplish lateral streak on anal segment. The third, fourth, and fifth abdominal segments have each a subdorsal yellowish-white wart.

After the fourth day the green assumes a duller and rather deeper hue, and the white freckles show up in stronger contrast. Some specimens are very boldly marked with black. The colour then remains unchanged for a fortnight, after which time the wings assume a more ochreous tinge and become dull orange on the twenty-first day. The colouring of the imago then rapidly develops, changing to purplish-brown on the twenty-second day, while the head and abdomen remain dull green; and the imago emerged on the following day, the pupal state occupying twenty-three days.

Another, which pupated May 25th, 1912, emerged early a.m., June 17th, 1912; this also being twenty-three days in the pupa.

## COLLECTING NEAR VIENNA AND IN AUSTRIAN TYROL.

By H. ROWLAND-BROWN, M.A., F.E.S.

BEFORE leaving England last year, towards the end of June, for an entomological holiday east of the Alps, I had made careful note of Miss Fountaine's paper on the "Butterflies of Hungary and Austria" (Entom. xxxi. p. 281), and decided to open the campaign at the Rohrwald, near Vienna, the *locus classicus* of the "Emperors." As it turned out, I was only to make one visit, indeed to collect at all for more than a single day in this lovely neighbourhood. But June 24th was a day of days, all said and done, though it ended in my being arrested, marched indignant before a gorgeously uniformed stationmaster, and fined five florins for travelling without a ticket, I being under the impression that I had purchased a return to Spillern, and the guard refusing my half of the offending paste-board, or payment for same. I mention this to warn my brother collectors what to expect of Austrian State Railways. I was informed officially at Vienna that our Consul had suffered in precisely the same way, and that there was no redress, on appeal, from the judgment of the omnipotent individual who treated me (as I looked, no doubt) like a tramp. Double tickets on the Austro-Hungarian systems are printed for cutting in half, apparently when children under age travel. I should be glad, but hesitate, to think the stationmaster at Spillern accepted the torn half as a compliment to my juvenility.

On arrival the way to the Rohrwald leads up through the town, then to the right on the Vienna road for about half a mile, and by a cart-road turning off to the left. It is a long and on such a midsummer day a decidedly hot walk, but for a couple of miles there is a footpath through fields and by the side of a stream, which eventually leads into the village of Unter-Rohrbach. Immediately outside Spillern the first *Apatura ilia* greeted me, a typical example in all its fresh beauty. I did not catch it, nor attempt to. In the fields, which unfortunately for me had just been mown, there were a few *Chrysophanus hippothoë* females of the spring brood still flying about, otherwise nothing worth mention; nor was it until I had left the village behind, and was already on the outskirts of the famous forest, that the butterflies began to show up. Almost the first, and I never saw but this one of the species again, was a worn female *C. dispar* var. *rutilus*, rather a surprise, as it is not included in Miss Fountaine's list. As I afterwards found, I should have kept straight along this road for a good mile past Ober-Rohrbach to reach the best collecting ground, but my instinct is always to follow up the brooks, and I made a divagation which occupied

quite an hour. Nor could it be said to have been altogether wasted, though butterflies were remarkable more for their quantity than their quality. Every bush was alive with *Limenitis sibylla*; up and down the narrow path leading to a wide clearing dashed males of *Apatura iris*, extremely difficult to net hereabouts; and *Dryas paphia*, *A. adippe*, *Melitæa athalia*, and *Pararge ægeria* var. *egerides* literally swarmed. In the clearings, too, there was an abundance of Anthrocerids, chiefly *A. hippocrepidis*, *A. scabiosæ*, and *A. vicie* (*meliloti*). Lycænids were not common. I only noted in the whole day one *Rusticus argyrognomon*, two or three *Everes argiades*, and occasional specimens of *Polyommatus icarus* and *Celastrina argiolus*. *Adopæa sylvanus* and *A. lincola* were, however, in full force, while on the road it was curious to observe the hibernated *Vanessa io* flying with freshly emerged *Pyrameis atalanta* and *Polygonia c-album*. Leaving this byway and regaining the main road, I presently struck the house of the Forester, and here the ways again diverge, a cart-track to the left leading to the heart of the forest, round the edge of a great marsh, that to the right (where there is a fine fountain, and the only drinking water available) leading up in the same direction, but on the further side of the marsh. I had hardly entered the wood when I realised the sovereignty of the Apaturids in all their splendour. Innumerable *A. ilia*, mostly typical, but some of the ab. *clytie*, all males, were running over the little moist patches on the sandy paths, or jostling one another from the mule-droppings. *A. iris* was quite as frequent and pugnacious, while everywhere the graceful *L. sibylla*, and, rather more rarely, *L. camilla*, gleamed in the sunny glades. And presently I was aware of yet another of this lovely group—that *Limenitis populi* which I had sought and seen, but never taken, in the forests of the Aisne. This butterfly is very soon battered. I took six or seven males during the day, and liberated them all as in one way or another defective; the only perfect example escaped from the net. In much the same localities, on the grassy wayside banks, I took quite a decent series of that other Samoussy speciality, *Melitæa maturna*; but this also was on the wane. Of the Satyrids, *Pararge achine* still survived; *P. megæra* and *Aphantopus hyperanthus* were fresh, and also *Cœnonympha arcania*, the one or two *C. iphis* netted being, on the contrary, in rags. Common also were *Aporia cratægi*, *Leptosia sinapis*, *Gonepteryx rhamni*, and *Aglais urticæ*, while the privet blossoms, beloved of *maturna*, yielded *Strymon ilicis*, and one or two very fine *S. pruni*. I had intended a second visit to the forest, or should have worked much more sedulously than I did. With regard to *C. var. rutilus*, I was informed by two Viennese entomologists I met on the way home that, though not unusual in some other suburban places, the Rohrbach district was not regarded as a favoured locality. Com-



pared with Budapest specimens of the first emergence, this solitary female is decidedly small, and there was remarkable uniformity among the Apaturids, so wonderfully variable in the western forests of Longuyon (Meurthe-et-Moselle), and Éclepens, N. Switzerland.

The next three or four weeks were spent by me mainly at Herkulesbad, of which, in view of the several current and other interesting papers published in the 'Entomologist,' as well as Miss Fountaine's previous observations on the butterflies there, I propose to say no more than that the first fortnight of July is decidedly *not* the best time for the rarer species by which this beautiful Hungarian spa is linked in the memories of so many British collectors. My observations entirely concur with those of Dr. J. N. Keynes (Ent. Rec. vol. xliii. p. 161) as to the appearances of *Erebia melas*. It is much earlier on the wing than our English authorities suggest. I saw it fresh on the Suskului on July 10th, a mountain, by the way, which yielded better results in every way than the more famous and much-hunted Domogled. On July 13th I was back at Budapest, but found the collecting most unproductive (weather hot, windy, and stormy). On the 18th, therefore, I set off for Wolfsberg to try my luck in Carinthia.

The journey to Marburg was made under a flaming sky, and I envied the people sun-basking in their bathing clothes on the sandy shores of Lake Balaton. From Marburg to Wolfsberg the weather held, and the fine sunset gave promise of a favourable morrow. My diary records: "July 18th, a fine hot day," and then the ominous words, "the last for a very long time." In fact, it is no exaggeration to say that I never had a really seasonable day again to the 28th, when my collecting for 1912 was at an end.

The 19th, however, was bright and warm in the morning, but as Baedaeker gives five hours for the Sau Alpe, my immediate objective, I did not start early enough in the morning. It should be five hours there, and at least four back, as I speedily realised after a broiling walk across the great cultivated Lavantthal, which separates Wolfsberg from the Sau. No English entomologists appear to have visited this locality since 1897, when the late Mr. F. C. Lemann, in company with Dr. T. A. Chapman, Mr. W. E. Nicholson, and Mr. R. Wylie Lloyd, made a successful expedition to the Carinthian Alps hereabouts (*cp.* "The Butterflies of Carinthia," Ent. Rec. vol. x. (1898), pp. 12-15), and had I reckoned the remoteness of this locality I should most certainly have made for Stelzing, their first headquarters, on the far side of the range, less than two hours from the upper slopes of the mountain known as the Grosse Sau Alpe (6828 ft.). Still, the Lavantthal approach, though wearisome in point of distance, is an agreeable hunting ground once across the valley, while the



Kor Alpe (7024 ft.) is actually best reached from Wolfsberg itself. The butterflies I particularly wanted were *Erebia arete* and *E. eriphyle*, with the exception of *E. afer*, the only two members of the group whose known haunts I have not visited at some time or other in my entomological rambles. I may at once say that I saw no vestige of either species, and, as far as *arete* is concerned, was somewhat comforted to hear from Herr Höfner, the local authority upon the Lepidoptera (Macro- and Micro-) of Carinthia,\* that this was not the year for *arete*, it being, in his opinion, one of those mysterious species credited with intermittent appearances. I mention this not because I am convinced of its entire accuracy, but as an encouragement to any collector who may be inclined to break new ground on the Eastern Alps in 1913, or other "odd-number" years.

Mr. Lemann found *E. arete* "widely distributed over the Sau Alpe," but non-existent on the Kor Alpe; *E. eriphyle* on both Alps, but localized. The road leading up to the Sau from the Lavantthal is well wooded, with a copious rushing stream of crystal clearness, punctuated with occasional saw-mills. The forest passes from alder and beech to pine, and there are plenty of flowery bypaths and little meadows which, unfortunately, in my anxiety to reach the top, I barely entered. On the roadside (where the wild raspberries were in full fruit) *Heodes virgaureæ* males were extremely plentiful and in perfect condition, with occasional tawny females, the antemarginal points, as a rule, of clear cerulean blue, more richly coloured even than my Digne beauties of 1911. I was too late for *Limenitis populi*, but *L. camilla* and *L. sibylla* were equally abundant, and on the way up I netted several worn males of *Neptis lucilla*, which were immediately liberated, one perfect female being taken at rest on a *Viburnum* on the return journey. Indeed, I should say that *lucilla* was decidedly commoner hereabouts than at Herkulesbad. Males, also more or less battered, of *Apatura iris* were settled by the roadside runnel, and I again took one fair female so intent upon her "afternoon tea" that I actually pill-boxed her—a record, I fancy, in the way of capture of this sex of *iris*. I had left Wolfsberg at eight. By one o'clock I was still far from the goal of my ambition, for the rain had come on, and some promiscuous collecting on the lower road had held me back. However, I went on directly it ceased, and presently the universal *Erebia ligea* gave place to the first specimens of *E. epiphron* var. *cassiope*, which, I need hardly say, I pounced upon, under the impression that they must be *E. arete* at last. I was now in sight of the summit ridge, and it was two o'clock, when down came the rain again, and I gave up in despair, with the prospect

\* Cp. Wien ent. Zeit. 1883, p. 193, and his work on the Macro-lepidoptera of Carinthia.

of a long plod back through dripping woods and soaked to the skin. The afternoon, however, brightened, and as I got back to the *lucilla* ground the sun shone out once more. Here, now, I found *Araschnia levana-prorsa*, of which I have bred many in the past, but had never yet encountered the summer brood upon the wing. It was evidently just emerging, but is very easily lost in pursuit against the dark background of the trees. I got back to the extremely comfortable inn at Wolfsberg, kept for generations by the Pfundner family, about eight, and for the next three days (20th–22nd) collecting was impossible, though I made a start for the Kor Alpe on the 21st, at six a.m., to be a second time driven back by wind and weather. In the afternoon, however, I had the great pleasure of visiting Herr Gabriel Höfner, and going through his fine local collections, which are especially rich in Micros. He told me that all the big “Blues” of the *Lycæna* group are common in the Lavanthal, and both *L. arcas* and *L. euphemus* in the immediate neighbourhood of the town. My one day on the Sau Alpe produced, among other commoner species, the following Rhopalocera:—

*Adopæa lineola* and *A. thaumas*; *Heodes virgaureæ*, *Chrysophanus phlæas*; *Lycæna arion*, *Cupido minimus*, *Nomiades semiargus*; *Leptosia sinapis*, *Colias edusa*, *C. hyale* (in the plain); *Apatura iris*, *Limenitis camilla*, *L. sibylla*, *Neptis lucilla*, *Araschnia levana-prorsa*, *Polygonia c-album*, *Dryas paphia*, *Argynnis adippe*, *Aphantopus hyperanthus* (one fine example of ab. *arete*); *Erebia epiphron* var. *cassiope*, *E. ligea*, *E. æthiops*, and *Cænonympha satyrion*—a meagre list, and by no means representative of the splendid lepidopterous fauna of the district.

July 23rd being no improvement on its predecessors, I made tracks for the Brenner, and took up my quarters once more at the Post Hotel, which I found (in the dependence) much improved in every respect. Since I was there in 1904, the whole mountain side on the opposite bank of the little stream has changed in character. The forests have been felled in many places; the paths I knew have disappeared, while finger-posts indicate the chief routes for tourists on the climb. I spent four days at Brenner—all save the first wet—but on July 24th I took and saw more butterflies in three hours than upon the whole of the tour of six weeks put together, with the exception of that one memorable day outside Vienna, at the Rohrwald. For the rest it was bitterly cold, and the wind terrific at times. The *Erebias* were common as ever; *Erebia pharte* females, rather worn; typical *E. pronö* females in very fine condition. On the Col below the Wolfendorn *Melitæa asteria* was fairly plentiful, and *M. cynthia* just emerging; and hereabouts I also took, for the first time at Brenner, *Hesperia andromedæ*, and, lower down, *H. cacialæ* (common). The two Alpine “Blues,” *Polyommatus eros* and *P. pheretes*, were quite common; *P. optilete* rather less

so. But I have no more species to add to my previous lists of the Brenner (*cp.* Entom. vol. xxxvii. pp. 225-226, and Ent. Rec. vol. xiii. pp. 96-97), to which I bade a reluctant farewell on the 28th, having endured certainly as bad a run of luck in the way of weather as I ever encountered on my Continental travels with a net.

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## BUTTERFLY-HUNTING IN THE BALKANS.

BY A. E. GIBBS, F.L.S.

(Concluded from p. 130.)

(PLATE IX.)

### BOSNIA.

ON the morning of June 19th I met by appointment at Sarajevo, Mr. P. J. Barraud, of Bushey Heath, who had come through from Vienna in the night, and the greater part of the time devoted to collecting in Bosnia was spent in his company. By the kindness of a friend, whose acquaintance I had made in Montenegro, we were able to explore, in his motor-car, the interesting and little visited country which lies on the borders of Servia, Montenegro, and Turkey. This is not the place to dwell upon the enjoyments of motoring in the Balkans, or to relate the adventures which befel us. Our headquarters, after leaving the capital, was Gorazda, on the Drina, a convenient centre with a fairly decent inn. The ride from Sarajevo to Gorazda, over a mountain pass 4000 ft. above sea-level, was an experience never to be forgotten. At Gorazda I became friendly with an Austrian gentleman, whose business took him to many of the towns and villages in the neighbourhood, and he kindly invited me to go with him on one of his journeys, offering me a seat in his carriage. So, while the car made a successful attempt to get across the Turkish frontier, I drove with Herr Folje to a place called Cajnica, most beautifully situated at the foot of a fir-covered hill. We lunched together at the hotel, and, while my friend was doing his business, I took my net and wandered up the shady mountain-side. There was a Turkish cemetery at its foot, where the grass was long and uncut, and I ventured to climb the fence to see what could be caught. The reward was found in a useful series of *Argynnis amathusia*, fresh from the chrysalis, which were flying, in company with *Melitæa aurelia*, among the graves. Much was not to be expected under the trees on the hillside, but I found a clearing where apparently it was intended some day to erect a pavilion, and here upon the wild flowers I took a specimen of *M. trivia* which was flying with *M. didyma*, *Plebeius argus*, *Polyommatus icarus*, *Pararge mæra*, and other common insects such as *L. sinapis*, *P. napi*,



*A. cratægi*, and *P. egeria*. On the drive back to Gorazda we were overtaken by the car, and abandoning the carriage to the care of the driver, we all crowded into it—seven of us all told, belonging to four different nationalities, and each trying to narrate in his own tongue the events of the day. Mr. Barraud had done no butterfly-hunting, but the car, after adventures many and amusing, had succeeded in reaching Plevlje, in the sandjak of Novi-Bazar, where its appearance caused a great sensation.

A day's collecting at Gorazda yielded poor results. In the morning we lost ourselves in the cow-tracks among the scrub on the mountains, and got nothing but a few specimens of *T. ilicis*, while my most notable capture in the afternoon was a bleached *E. janira*, which might have come from the New Forest.

From Gorazda we went on to the town of Foča, a quaint and curious place on Austrian territory, but thoroughly Turkish in its appearance, with many mosques and picturesque but squalid bazaars. Like all these border towns it was full of the soldiers of the Emperor Franz Josef. The morning of June 25th, the day after our arrival, was intensely hot, and as we climbed up to a Dervish monastery on a hill above the town, it was evident that a storm was brewing. However, as time was precious, we persevered, and on a grassy slope we secured a few specimens of *Melanargia galatea* var. *turcica*, a darker form of the species than I had taken elsewhere. The only other capture worth mention was a large and well-marked female *C. pamphilus* of the southern summer form, with unusually broad dark borders, especially to the hind wings. But the storm was quickly gathering, and hardly had we got back to the town before it burst upon us with all its fury. After lunch we left Foča in torrential rain, which fortunately did not last long, for a thirty miles drive to the station of Ustipaca, on the wonderful eastern railway which Austria has built for strategic purposes through apparently inaccessible gorges right up to the Servian border line, where it abruptly stops. From Ustipaca we caught the evening train back to Sarajevo.

Our next excursion was to the better wooded country in the north-west of Bosnia, travelling by railway from the capital to Jajce, one of the most interesting and historic places in the Balkans. Here there is an excellent hotel, with a landlord who speaks English. Near Jajce is an idyllic spot called Jesero, about three hours' walk up the valley of the Pliva, and on the morning of June 29th we drove there, intending to explore the valley beyond the village and walk home in the afternoon. The road to Jesero led by the side of two pretty lakes of the same name, and in the village a government resthouse has been erected, where a simple lunch, in which trout from the river is the chief item, can be obtained. The morning was bright, and as we passed through the village



we saw several specimens of *Apatura iris* and *A. ilia* var. *clyte*, but did not succeed in securing either of them. The most abundant butterfly was a *Melitæa*, which turned out to be *M. athalia* var. *mehadensis*, and this insect settled in little companies on damp places in the road and on the horse-droppings. Wherever we went in the northern districts of Bosnia we met with it in great numbers. Just as we were leaving Jesero, near a picturesque mill, Mr. Barraud caught a fine specimen of *Eugonia xanthomelas*, the only one seen in the 'course of our wanderings. We walked a mile or so along the road beyond Jesero, and then turned up a valley on the right, where I saw *Parnassius apollo*. We had ordered lunch to be prepared for us at the little restaurant by the lake, and on our way back, in a flowery corner on the edge of a small field, we observed some Theclids flying over the brambles, and eight specimens of *T. spini* and one of *T. acaciæ* fell to my lot. After we had done justice to the trout we started to walk back to Jajce, intending to work the boggy ground by the lake-side, but the excessive rainfall had caused a rise in the water level, and it was quite impossible to wander many feet from the roadway. At one spot, however, where the ground was a little higher and dryer, we were able to investigate a small meadow in which the grass was uncut, and here I took several tiny *Melitæas*, only 28 mm. in expanse, which puzzled me. They proved to be dwarf specimens of *M. aurelia*, a species of which I took a short series of varying sizes on the margins of these low-lying meadows. *A. phœbe*, too, was flying in nice condition, and several specimens of *A. thetis* were added to the bag. The following day we determined to see what was to be had on higher ground, so we engaged a guide, hoping to find some mountain butterflies. But the quest proved rather disappointing, the hillsides being either closely grazed or so steep and stony as to prove very poor collecting ground. The most noteworthy capture was the striking aberration *navarina* of *M. athalia*, which I found in a meadow by the side of the railway on our homeward journey. Over the skrees *S. hermione* was flying, and at a turn of the footpath *Lycena arcas* found its way into the killing-bottle. After dinner that evening we strolled about the village, boxing a few moths from the white walls of the houses, below the arc lamps, which attracted night-flying insects in swarms, but which were too high up to be of much use for collecting purposes. *Chærocampa porcellus* and *Cossus ligniperda* were the most conspicuous insects taken.

From Jajce we went to Banjaluka through the beautiful and verdant gorge of the Urbas, and on the fifty miles drive I think I saw more butterflies than during the whole of the rest of the holiday put together, the *Melitæas* swarming on the road in countless thousands. It was glorious butterfly weather, but

the way was long and there was no time to unfurl the nets. At Banjaluka, after a most interesting day spent in the market with the cameras, taking snapshots of the natives attired in striking and brightly coloured garments, Mr. Barraud and I parted company, my friend starting on his long homeward journey to England, while I returned for another day among the lepidoptera at beautiful Jajce. I decided next morning to work the wooded hill, on the lower slopes of which the old Christian village is built, and which had an inviting look from the terrace of the hotel. So, crossing the bridge, I ascended the steep pathway between the houses and gardens. In a damp place in a maize field I found *L. arcas* flying with *A. phæbe*, the latter in such shabby raiment as not to be worth catching. Higher up, in an uncut meadow, I got several dark *M. galatea*, but as a number of men were at work close by I thought it best to keep out of the standing grass. Then following a narrow track through a cornfield I hit upon some more meadows and grassy places among the woods, where *C. edusa*, *A. aglaia*, *A. adippe*, *E. janira*, and the common *Melitæas* and "blues" abounded.

On July 5th at Travnik, a curious old town, I spent the best hours of the morning photographing the interesting scenes in the market, held round a painted mosque, which made an artistic background for my pictures. Then I went for a walk along the valley in search of insects, and got several nice male specimens of *Lycena meleager* and watched an Apaturid, which I think was *A. ilia* flying round a willow tree, while *M. galatea* sported with *C. edusa* on the railway bank. But, as was so often the case, the bright morning was succeeded by a cloudy afternoon, and although I continued to work, this time on the north side of the town and in likely situations, nothing extraordinary was found. Travnik has every appearance of being a good butterfly place, and given a favourable season, the slopes of Mount Vlassic, which rises above the town, would doubtless be worth working. The insects I took at Travnik included *C. hyale*, *L. sinapis*, a dark form of *P. orion*, *B. dia*, and *A. phæbe*.

On July 6th I found myself in Illije, a fashionable bathing station a few miles from Sarajevo. Half an hour's walk from the hotels, through a shady avenue which appeared to be endless and where, of course, there was no work for the net, brought me to the source of the river Bosna, which rises in the pretty grounds of a restaurant at the foot of the mountains. In the meadows by the side of the ponds a single specimen of *Erebia ligea*, with the white markings of the under side strongly developed, was found in company with *E. æthiops*, which was fairly abundant, *A. phæbe*, *M. var. mehadensis*, *M. dictynna*, *M. didyma*, and *P. argus*. A beautiful male *A. iris*, the only Apaturid actually taken in Bosnia, was wheeling round the trees

by the roadside, but a descent to earth proved fatal. *Dryas paphia*, in all the pristine beauty of its recent emergence, was flitting over the brambles, attracting the attention of a little Bosnian boy, who with a home-made net was trying to catch butterflies, while his parents were resting in the gardens. I returned home later in the day with this embryo entomologist who got me to name his captures for him. While I was eating my trout at the restaurant the cook brought me from the kitchen a specimen of *Mania maura*, so badly handled as to be hardly recognisable, but which had, of course, to be accepted with thanks, and afterwards added to the collection of my little friend of the home-made net. At the foot of the hill close by was a bank covered with brambles and wild flowers where butterflies abounded. Here I took *Thecla quercus* and *Aphantopus hyperanthus*, the only representatives of the two species which I met with in the Balkans. The brambles proved very seductive to *L. camilla*, which was here in good condition; and higher up the hill, in a field, I got male *L. meleager*, *C. alciphron*, and *Zygæna carniolica*. This pleasant day at Ilije ended my collecting in Bosnia, save for a short expedition on the slopes of the Trebevic mountain above Sarajevo, in search of *C. myrmidone* which, according to the books, ought to be found there, and for which I twice searched in vain.

On the whole my insect work in the Balkans was rather disappointing, but in every other respect the holiday was extremely successful, and proved to be one of the most interesting and enjoyable I have ever taken.

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## A MONTH'S COLLECTING IN HUNGARY.

By GERARD H. GURNEY, F.E.S.

(Concluded from p. 104.)

On June 4th I ascended the Domogled, which is a mountain east of the town, and rises to a height of about 3700 ft. It was a brilliantly fine day, with hot sun and no wind. I saw very little of interest on the way up, though after passing the Weisses Kreuze Wood *P. napi*, *P. cardamines*, and *P. egerides*\* all became exceedingly plentiful. Emerging from the beech forest after a very hot, lengthy climb, I found insects to be fairly numerous on the slopes of the peak, and if I did not get anything unusual the superb view spread out all round me amply made up for the lack of varieties. Looking to the south one saw a panoramic expanse of Roumania stretching away into a series of low hills and

\* All of this species found here in June by me were *egerides*.—H. R.-B.



valleys as far as the eye could reach; to the west the fields of Bosnia lay far below; while north, in the dim distance, little silvery patches, that looked like pieces of shining glass, revealed the presence of the Danube, flowing from distant Budapest, nearly three hundred miles away.

Where the beech forest ended, flying amongst the trees—fresh at this elevation and almost common—were quite a lot of *P. manni*. Here also were one or two *P. mnemosyne*, and a few fresh *M. cinxia*. Beautifully dark females of *B. euphrosyne* were busy egg-laying on the small yellow pansies which grew abundantly here, and *P. orion* was not uncommon. In a little grassy hollow near the actual peak itself were one or two worn *Aglais urticae*. Descending again to the edge of the wood I intended to stop there some little time, as butterflies were rather numerous, but the repeated furious attacks of three enormous sheep-dogs caused me to beat a rather hasty retreat, and so I did nothing more there, but picked up a few *P. orion* near the Weisses Kreutz on the way down, altogether an interesting day, though I was disappointed in not meeting with either *Neptis lucilla* or *Erebia medusa* var. *psodea*.\* The following day I again went up the Czerna gorge. *P. manni* and *N. aceris* were both common, and I found *Cænonympha arcania*, a very brightly marked form, just beginning to come out, and I also took single examples of *Melitæa matura* and *Chrysophanus alciphron*.

With many regrets I left Herkulesbad that evening, arriving back again at Budapest the following morning, June 7th, and it was not long before I was again on the war-path, and on the way to the now familiar meadows at Budafok. A pleasant change of things had taken place during the ten days I had been

\* My impression after four expeditions to the mountains above Herkulesbad in July this year is that the Suskulni is a much more productive locality than the Domogled. The route is from the well-known Quelle about an hour beyond the Weisses Kreutz, and there is no water to be found after this spring on the way. The path is eventually much more open than that to the Domogled; there is a fine flora, and there are no herds at any time on the top, and consequently no dogs. But there is a forester's hut with extremely agreeable occupants. The month of July is not to be recommended for Herkulesbad generally, as it is "between broods," so to speak. This year *Pararge roxelana* was in a more or less dishevelled condition on July 5th in the Weisses Kreutz woods. Both *Neptis lucilla* (in the Quelle woods), *N. aceris* (in the Czernathal), and *Erebia medusa* var. *psodea* (on the hills) were over. It should be noted, however, that *E. melas*, as Dr. J. N. Keynes has pointed out elsewhere, is a much earlier insect than we have been led to suppose hitherto. I saw it on the Suskulni, at about 3000 ft., on July 10th, but there was a stiff breeze blowing, and before I could get my net to work the butterfly was carried far away; and this happened more than once. Indeed, the wind spoilt collecting most days. Lepidopterists, however, visiting the Domogled in future should not fail to look for *Polyommatus anteros*, taken by Dr. Keynes near the summit, where, owing also to the high wind, I saw next to nothing, though the sun was in a clear sky.—H. R.-B.



away; the luxuriant hay and grass had grown up till nearly everywhere it was three-foot high, the flowers and flowering-plants were wonderful in their variety and abundance, large stretches of ground being purple with *Salvia pratensis*. Moreover, the butterflies, which, when I left were not generally in abundance, were now in the greatest plenty. Fresh *A. crataegi* were in countless swarms everywhere, with *E. ianira* excessively common also; hosts of newly emerged *I. lathonia* hovered wherever the hay was not quite so long; while very numerous were *R. argus*, *P. icarus* (with very large males), and *C. iphis*, which were still in presentable condition. Fresh *A. thetis* were frequent, and the fine dark *P. mæra* common; while *Pyrameis cardui*, *A. urticae*, and *P. daplidice* added to the bag. I had not gone far along the path towards Kamaerardo before I saw the first *Chrysophanus dispar*—only, of course, var. *rutilus*, flying along the side of a small ditch, with the sun shining full on it. It was, indeed, a brilliant object, and no one who has not seen this exquisite species on the wing can have any conception of the beauty of its red-gold wings when it is alive. This specimen, a male, in most perfect condition, was soon followed by others, and I found it to be common though local, and on this day I took nineteen perfect specimens, including five females; they were all very large and fine, in fact, they run very close to many specimens of *dispar*.

On subsequent days I found it to be quite common, though it was not found everywhere; I took most of my specimens off the purple scabious, which was the *only* flower I ever saw *Rutilus* on; *never* on the white composite, which previously had been so attractive to *C. thersamon*. But, to continue the account of my doings on June 7th: near the farmhouse by Kamaerardo Wood I got five fresh *Carcharodus althææ*, and in the wood itself *Strymon pruni* was not uncommon, though already rather torn; here, too, *C. arcania* was plentiful. On the *Aristolochia*, which grows at this point abundantly, were a great many larvæ of *T. polyxena*, in all stages of growth; while fresh *Argiades sylvanus*, worn *N. tages*, one or two *P. daplidice*, and plenty of *M. phæbe* were noted here.

Rather further on, where some tall thistles were growing luxuriantly amongst the hay, I found a great profusion of butterflies, and secured, to my surprise, a magnificent male *Dryas pandora* off a thistle-head, to be followed almost directly after by two more specimens, and on subsequent days I got several others. This species is generally rare near Budapest, though found plentifully in many parts of Hungary; all those I saw were in the vicinity of Kamaerardo Wood, and are very large specimens, though perhaps not so big as some Spanish ones. I paid other visits to these delightful marshes on the 10th and 12th, and always spent long and interesting days there.

On the 12th *C. rutilus* was really quite common, though some of the males were even then beginning to get a little bit worn. On the 12th, too, I took a single specimen of *Argynnis niobe* var. *eris*, which I had not seen before.

The afternoon of the 11th I spent on the Schwabenburg, where in places butterflies were numerous. On one slope on the south side of the hill, *A. niobe* var. *eris* was rather common; here also, but confined to one very small dell, were three or four *Brenthis hecate*, a species whose acquaintance I had not expected to make until I got to Pészer; it is very rare near Budapest, and extremely local in the few places it does occur in. *M. trivia* was very scarce, and I saw only three specimens, and these were a good deal worn; but *I. lathonia* was common, and I netted one fresh *Melitæ aurelia*, the only specimen seen. *A. thetis* and *P. hylas* were common in one or two spots, the latter rather small; *R. argus* was frequent, but I saw no *P. orion*. *II. carthami* flew about gaily, and was still quite fresh, while other species noted on the Schwabenburg were *A. sylvanus*, *E. cardamines*, *E. ianira*, *P. mæra*, *Lowcia dorilis*, *P. icarus* (very common), *M. cinxia* (worn), *M. phœbe*, and the two "clouded yellows," *C. hyale* and *C. edusa*.

Before I left England I had been told it was extremely difficult to get permission to go to Pészer, which, besides being a most wonderful locality for butterflies, is a very interesting place from other points of view. The forest is all Crown property, and leave can only be obtained from headquarters. However, thanks to the kindness of a friend in a high official position at Vienna, the necessary leave was willingly granted, and all arrangements made for me by the Agricultural Department, and I cannot say enough for the kindness and courtesy of the gentlemen who made the plans which enabled the journey and day spent at Pészer to be enjoyed under the most delightful conditions.

Accompanied by Professor Schmidt, of the National Museum, and Mr. Czillinger, of the Forestry Department, I left Budapest by the early morning train on the 13th. The day was almost perfect, a brilliant morning becoming slightly hazy towards the afternoon. Arriving at Alsó Dabas Station about 8.30 we were met by a waggonette, and then had a most interesting drive of over two hours, for the last hour across a flat plain, where the road or track got fainter and fainter until it disappeared altogether, and we simply drove over the short grass. On our left large swamps stretched away for miles, while in front lay the low line of forest towards which we were making our way. Small rodents, about the size of a guinea-pig, watched us keenly from the edge of their holes; these were hamsters (*Cricetus frumentarius*), very pretty little brown animals with brown and white heads.

The Forest of Pészer is a long, narrow strip of wood, composed mostly of acacia and poplar trees, though in one part oak and birch largely predominate; the soil is very sandy. At the south end of the wood are numerous sandhills, between which are open glades; the vegetation is exceedingly luxuriant and varied. No sooner had we entered the wood than we were amongst butterflies in great numbers; in one or two places where we went in the afternoon the profusion of insects was so great that it made one's eyes ache to watch for long the continual movement of the thousands of fluttering wings hovering over the herbage. I think perhaps *A. sylvanus* was the most plentiful butterfly on the wing; it was in swarms everywhere. The only other member of the family that I saw was *H. carthami*. In point of numbers, though, *A. sylvanus* was run very close by *B. hecate*, and this rare and local species was excessively abundant—all in perfect condition, and the newly emerged females very fine, with a beautiful purplish gloss on their wings. *M. trivia* was another very common species; some worn, but most in perfect order. Fine dark *M. athalia* were also abundant, though rather more local. A single specimen of *D. pandora* was secured, the only one seen, but *A. niobe* var. *eris* and *I. lathonia* were both common. On the blossoms of the privet were many Theclids. *Strymon acaciæ*, *S. ilicis*, and *S. pruni*; the first two species were very common, and both quite fresh, *S. ilicis* being of large size and very black; *S. pruni* was frequent also, but generally much torn. In the open glades beautifully fresh *C. alciphron* males were greatly in evidence; this species has a very quick flight, and is rather difficult to follow with the eye. The females seemed to be quite rare.

*Melanargia galathea* var. *procida* was excessively abundant in certain places—fine dark specimens, in the pink of condition—while *A. cratægi*, *E. ianira*, and *P. icarus* were everywhere. On various plants were large numbers of full-fed larvæ of *Arctia caia*, and a beautiful iridescent Longicorn (*Lytta versicatoria*) was very abundant on ash trees. We were given an excellent lunch by the chief forester's wife in their delightful house in the middle of the forest, and though perhaps one rather grudged the time necessary for its proper consumption, it would never have done, by hurrying through the meal, to have offended our host the forester, for we relied on him to take us to the spot, in a distant portion of the forest, where we hoped to find the much wanted *Melanargia iapygia* var. *svarovius*. Our spirits rose high, cheered partly by his delicious home-made wine and partly by the assurance that "there was no hurry; we should find plenty *svarovius*," which assurance only made us want to hurry the more; and sure enough, when we did eventually, about two o'clock, reach the locality for this very local species, in two places, we found it very abundant and in perfect condition.



Excepting localities in South Russia, Pészer is the only place where this form of *M. iapygia* occurs in Europe. Of the very few entomologists who have previously visited Pészer, it has only once before been found in anything like abundance, and that was by Miss Fountaine in 1897; its appearance is generally so erratic that many years only two or three specimens will be taken in a season, and when we left Budapest I felt doubtful if we should even see it. The two localities at Pészer where it flies are not far apart, and are each about an acre in extent, and though we found wanderers in one or two other places, they were only stray ones from its headquarters. The soil in these two localities is almost entirely sand, and is covered with two or three species of coarse grass, one or more of which is doubtless the food-plant of *suvarovius*. All the specimens we took were very large and fine. In the full sun it flies swiftly and strongly, but settles on a flower-head or blade of grass directly a passing cloud obscures the sun, and during several dull periods I found three, and once four, specimens on one thistle. An interesting point about this species is that it *fixes* its eggs instead of dropping them promiscuously on to the ground, as *all* other *Melanargias* do.

There were not many other butterflies on this particular bit of ground, but, returning to the forester's house late in the afternoon, I took three male *Colias myrmidone*, the first time I had come across this species in Hungary, though I had been continually on the look-out for it; it is much more plentiful in the second brood in July. And so ended a wonderful, red-letter day in one's entomological life—wonderful not only on account of the butterflies, but also because of the great interest and fascination of the place itself, with its teeming fauna and floral life all round one, and it was with overflowing boxes and specimen cases that we got back to Budapest at 10.30 that night.

I paid a final visit to the Budafok marshes on the 15th, and found another great change had taken place since my last visit; all the hay had been cut, and not only that, but every scrap of standing herbage had been laid low also, and instead of innumerable butterflies fluttering everywhere, as I had left when last here only four days before, hardly a solitary insect was to be seen! One rather wonders what happens to them all; where do they go to? No doubt the *cratægi* and the stronger flying species can seek out pastures new, but what becomes of the swarms of "blues," and the innumerable *E. ianira* and *C. iphis* which were so common? Moreover, the destruction of young larvæ must be very great. Amongst the hay and on the edges of the streams the large water-dock flourishes exceedingly; these plants must nearly all have had ova and young larvæ of *Rutilus* on them, all of which necessarily perish when the plants are cut down, and it looks as if this locality would before long



know this beautiful "Copper" no more, while *C. thersamon* and other interesting species will probably share the same fate.\*

Leaving the meadows which proved so unprofitable, I went up a sandy lane on the left, the banks of which were thickly covered with sloe bushes; flitting round these were numbers of *S. acaciæ*, all in beautifully fresh condition, while another *D. pandora* found its way into my net. Every sloe bush had three or four clusters of the orange eggs of *A. crategi* upon it, and in one place were covered with the enormous full-fed larvæ of *Saturnia pini*.

The following day I left Budapest, and arrived in London two days later.

## BEES OF THE GENUS *MEGACHILE* FROM AUSTRALIA.

By T. D. A. COCKERELL.

*Megachile cornifera*, Rad.

THIS remarkable insect was described as from Sydney, where it certainly never was found. It has been rediscovered by Mr. Horace Brown at Southern Cross, two hundred and sixty miles inland from Perth, Western Australia; both sexes were forwarded to me by Professor Froggatt. The male, not before known, resembles the female, but is more slender, about 19 mm. long, the quite narrow face covered with light yellow hair, and without prominences; eyes red; anterior tarsi flattened, very light yellow with a large ferruginous spot at the end of each joint, the last joint ferruginous, the first joint very short, crescentic, the whole tarsus very broadly fringed on each side with white hair; anterior coxæ with long curved spines; hind tarsi extremely long; middle tarsi short; sixth abdominal segment with a broad transverse keel, obliquely emarginate in middle; venter of abdomen with much white hair. Also at Southern Cross, Mr. Brown collected a female of *M. fumipennis* (Froggatt, 205).

\* I traversed this same ground on July 16th; the morning brilliantly fine, the afternoon attended by a downpour of tropical violence. The sole Chrysophanid observed was *R. phlæas* (one specimen), and hardly a butterfly was to be seen, except *S. circe*, on the sandy cart-track just before coming to the village of Kamaerardo. Evidently the second generation of *C. dispar* var. *rutilus*, and *C. thersamon* had not emerged here; but, as Mr. Gurney points out, the cutting had been conducted ruthlessly, and the mortality of larvæ must have been enormous. I may add that on this ground I was asked by the forester for my "permit." I need scarcely say I had none, but I made him understand I was an English entomologist, and he appeared quite satisfied to let me proceed in peace. My bag for a six hours' day was absolutely nil! *C. thersamon*, second generation, at Farkes Volgy, outside the Bude Cemetery, fresh, July 17th.—H. R. B.

*Megachile phenacopyga*, Cockerell.

Waroona, Western Australia, March 9th, 1908 (*G. F. Berthoud*; Froggatt, 208). A female from the same locality and collector (Froggatt, 207), but collected December 26th, 1908, agrees with a female "*M. ignita*, Sm.," from Western Australia, determined by F. Smith. It looks much like *M. phenacopyga*, and is perhaps its female; but if so, it cannot be *M. ignita*, since that species was originally described from a male with simple anterior tarsi.

An argument in favour of the reference of these females to *ignita* rather than to *phenacopyga* is found in the fact that they have the tegument of the sixth abdominal segment and the apical part of the fifth red, which is not true of male *phenacopyga*. A feature of the supposed female *ignita* is the presence of conspicuous white lateral hair patches on abdomen; this distinguishes it from *M. mackayensis*, *henrici*, &c. Smith indicates no such patches for male *ignita*. The abdomen of the supposed female *ignita* is of the relatively narrow, parallel-sided type, not broad like that of *M. chrysopyga*.

*Megachile horatii*, sp. n.

♂. Length about 13 mm.; like *M. erythropyga*, Smith, but larger, with hair of face pure white; third abdominal segment (as well as first and second) with lateral white hair-patches; sixth segment rather more produced; face narrower, with the eyes more parallel; eyes black.

Southern Cross, Western Australia, 1912 (*Horace Brown*; Froggatt, 206).

In the white hair of the face it is like the much smaller *M. tomentella*, Ckll.

I must add, with regard to *M. erythropyga*, that I possess only the male (a specimen from F. Smith's collection labelled New Holland, and two collected by French in Victoria); Smith's short description is characteristic, but it should be added that the apical margin of the fourth abdominal segment, except at the sides, is covered with red hair. The female was described from the W. W. Saunders collection, and is presumably at Oxford. Judging from the descriptions, it seems quite possible that the sexes described do not belong together; the female, in fact, is probably the insect referred to above as supposed *M. ignita*. Although the female of *erythropyga* has precedence of place on the page, it will be better, under the circumstances, to designate the male as the type. This leaves us with a series of readily distinguishable males (*erythropyga*, *ignita*, *phenacopyga*), and one (or two?) females which will have to be connected with the males by workers in the field.

*Megachile derelicta*, sp. n.

♀. Length about 12 mm., anterior wing nearly 7, the wings relatively short; black, elongated and parallel-sided, the abdomen widest at fourth segment; hair of head and thorax rather scanty, but conspicuously white at sides of face, around the shining tubercles, on under side of thorax and on metathorax; on the broad vertex, the mesothorax and scutellum, the thin hair is pale fuscous-tinted; head rather large, with broad cheeks; clypeus short and broad, the lower edge straight, but above the edge is a pair of large semicircular shining hollows, each one surmounted above by a small tubercle, the median space between the hollows occupied by a large tubercle; upper part of clypeus, face and front densely punctured, vertex with the punctures sufficiently separate to have shining margins; mandibles long, the apical margin with three short teeth, the inner margin with a low angular projection; labrum with a small red sub-apical tubercle, and its lateral apical corners acutely pointed; flagellum obscurely reddish beneath; hind ocelli much nearer to each other than either is to the occipital margin; mesothorax and scutellum shining, but very closely punctured; area of metathorax dullish, depressed in middle; tegulae dark rufous; wings dilute brownish, nervures piceous; legs black, with pale hair, the tarsi reddish apically; abdomen closely punctured, second and third segments with a deep transverse depression; sides of first abdominal segment with conspicuous white hair; hind margins of second and third segments with dense bands of pale yellowish hair, failing in middle, becoming white at sides; extreme basal margins of third and fourth segments with an ochreous line; fourth segment entirely without hair bands or spots; fifth and sixth segments, except at sides, covered with pale yellow tomentum (between dilute orange and ochreous); ventral scopa white, on the last segment fuscous-tinged.

♂. Length about 9 mm.; hair of face entirely white; anterior coxae with tubercles in place of spines; tarsi dark red, the anterior ones simple; tegulae rufopiceous; bands on second and third abdominal segments broadly interrupted in middle, and with very little yellowish; pale yellow apical hair-patch including fifth segment and a broad apical band on fourth (except at sides), and the base of sixth; sixth segment rather obtusely bidentate, the teeth broad-triangular; no apical ventral spine.

Female (type) from Windsor, Victoria (*French*; Froggatt coll., 198); male from Victoria (*French*; Froggatt coll., 50). Allied to *M. tomentella*, Ckll. (male), but differing by the dusky wings and conspicuous hair-bands. The female may be compared with *M. heriadiiformis*, Sm., but it has no bands on the fourth abdominal segment. The species is also somewhat allied to *M. trichognatha*, Ckll.

*Megachile hackeri*, sp. n.

I had identified this as *M. apicata*, Sm., but comparison with the genuine *apicata*, from Victoria, shows it to be quite distinct.

♀. Length,  $8\frac{1}{2}$  mm.; similar to *apicata*, but the three clypeal teeth very low and widely spaced; flagellum dark (bright red beneath

in *apicata*); mesothorax anteriorly without any traces of hair-spots; bases of abdominal segments not broadly pilose; sixth segment entirely red.

♂. Length about 7 mm.; differs from *apicata* by the dark mandibles (orange with dark base and apex in *apicata*); dark flagellum (in *apicata* light red beneath except at apex); apex of abdomen (sixth segment, not the morphological apex) with a pair of small tubercles or obtuse teeth (shallowly emarginate in middle, with about four sharp irregularly placed teeth on each side in *apicata*). In both the anterior tarsi are simple and their coxæ unarmed.

The female (type) of *M. hackeri* is from Kelvin Grove, Brisbane, Queensland, November 6th, 1911 (*H. Hacker*; Queensland Museum, 18). The male (Queensland Museum, 44) has the same data.

*Megachile apicata*, Smith.

♀. Windsor, Victoria (*French*; Froggatt coll., 200). ♂. Gippsland, Victoria, 1910 (*Froggatt*, 146).

The male is new; its characters are indicated above in comparison with *M. hackeri*.

*Megachile victoriae*, sp. n.

♂. Length about  $7\frac{1}{2}$  mm.; black, with scanty white hair on most parts of body; face and lower parts of cheeks with abundant pure white hair; eyes green; head nearly circular, facial quadrangle much longer than broad; mandibles black, with a tuft of pale yellow hair on inner apical corner; clypeus and front very densely punctured; distance between hind ocelli less than from either one to occipital margin; antennæ long and slender, the flagellum very obscurely brownish beneath; mesothorax and scutellum very densely punctured, but margins of punctures shining; a little tuft of dull white hair at each hind corner of mesothorax; tegulæ piceous; wings hyaline, the rather well-developed stigma and the nervures rufous; legs black, the tarsi reddened apically; anterior coxæ unarmed and anterior tarsi quite simple; abdomen shining, strongly punctured, the hind margins of the segments narrowly rufous; rudiments of white hair-bands at sides of first three segments; no apical hair-patch; sixth segment depressed above, the projecting part obtusely bilobate, emarginate.

Victoria, 1900 (*French*; Froggatt coll., 63). A rather insignificant little species, resembling *M. austeni*, Ckll., but much smaller, and without black hair on head and thorax.

*Megachile henrici*, Ckll.—Melbourne, Victoria (*Froggatt* and *French*).

*M. erythropyga*, Sm., ♂.—Melbourne, Victoria, January 20th, 1900 (*French*); Windsor, Victoria (*French*; Froggatt coll., 199).

*M. chrysopyga*, Sm.—Melbourne, Victoria (*Froggatt*); Bayswater, Victoria (*French*); Bendiga, Victoria, November 23rd, 1892 (*Froggatt*).

*M. lucidiventris*, Sm.—Windsor, Victoria (*French*).



*M. macularis*, D. T.—Nagambie, Victoria (*French*); Warialda, N.S.W., March 29th (*Froggatt*).

*M. semiluctuosa*, Sm.—Wimmera, Victoria (*Froggatt*); Rutherglen, Victoria (*French*).

*M. latipes*, Sm. — Rutherglen, Victoria (*French*); South Australia (*Lea*, 10710; *Froggatt* coll., 209).

*M. oculipes*, Ckll. (possibly = male of *aurifrons*, Sm.).—Warialda, N.S.W., March 29th, 1901 (*Froggatt*).

*M. serricauda*, Ckll.—Manilla, N.S.W., male bred from nest (cell of the usual form, 12 mm. long and 6 wide), January 20th, 1902 (*Froggatt*, 162). Larger than the type (length about 10 mm.), with reddish eyes, but otherwise the same. Another male, from Nagambie, Victoria, 1909 (*French*) is 10 mm. long, and has green eyes.

## NOTES AND OBSERVATIONS.

SOCIETY FOR THE PROMOTION OF NATURE RESERVES.—We have received the prospectus and appeal of the Society for the Promotion of Nature Reserves, and an extremely interesting document it is for naturalists in general and entomologists in particular. The objects of the Society are to collect and collate information as to areas of land in the United Kingdom which retain their primitive conditions, and contain rare and local species; to prepare a scheme showing which such areas should be secured and handed over to the National Trust, and thus safeguarded as national possessions against encroachment and destruction. Meanwhile, agreeing that one of the first results of success in this direction will be "to encourage the love of Nature study, and to educate public opinion to a better knowledge of the value of nature study," we may confidently look forward also to the exercise of more practical means than we have at present to rescue the rarer insects of the British fauna from extinction. And that the entomological aspect of the Nature Reserve will be carefully considered goes without saying, for among the many distinguished scientists comprising the committee we read the names of Professor E. B. Poulton, F.R.S., the Hon. N. C. Rothschild, Mr. E. G. B. Meade-Waldo, and Mr. W. H. St. Quintin. On the Continent not a few Governments have already done good work for the cause of natural history by enclosing favourable areas, and submitting them to an intelligent system of guardianship; the wholesale exportation of local lepidoptera and plants has been checked; and private owners have supplemented official effort by putting suitable land under Government control. A beginning has been made in England with Blakeney, a part of Wicken Fen, and the "Ruskin Reserve," near Oxford. But much more remains, and, as Dr. Chalmers Mitchell well put it in his address to the Zoological Section of the British Association at Dundee last year, it is only by the deliberate and conscious interference of man that the evil wrought by man in this respect has been, and can be in the future, arrested. The present

headquarters of the Society is in the Natural History Museum, Cromwell Road, London, S.W., and the hon. secretaries, Mr. Ogilvie Grant and the Hon. F. R. Henley, will be glad to communicate particulars to those interested or willing to join as members without subscription.—H. R.-B.

THE ENTOMOLOGICAL SOCIETY OF WASHINGTON.—On April 3rd Dr. David Sharp, Lawnside, Brockenhurst, Hants, England, and Dr. J. H. Fabre, Serignan, Vacluse, France, were chosen as the first two honorary members of the Entomological Society of Washington. The Entomological Society of Washington has ten honorary members to be chosen from among foreign entomologists.

PROTOZOAN PARASITES OF ICHNEUMONIDÆ.—I have recently named Ichneumonidæ containing these parasites, and the following communication has been most kindly placed<sup>1</sup> in my hands for publication.—CLAUDE MORLEY.

It is of interest to note that certain parasitic Ichneumons may themselves harbour Protozoan parasites. During the researches of Drs. H. B. Fantham and Annie Porter on the Protozoa of *Hymenoptera*, they discovered two parasitic Protozoa in *Stenichneumon trilineatus*, the common destroyer of the gooseberry moth, *Abraxas grossulariata*. The first parasite, found in the alimentary canal and fat body, is a very small sporozoön belonging to the *Microsporidia*, and closely allied to the pathogenic agent of the Isle of Wight Bee Disease, also discovered by these authors. The organism belongs to the genus *Nosema*. It forms small, oval, shining spores, about one-thousandth of the size of a rice grain. Each spore contains an amœbula which creeps out from the spore-coat and enters the cells lining the alimentary tract or the fat body, where it multiplies by repeated division. Each of the daughter forms thus produced ultimately secretes a coat for itself and becomes a spore. The spores serve for the infection of other Ichneumonids. This new Microsporidian is named *Nosema ichneumonis*.

The second protozoön is a Flagellate belonging to the genus *Herpetomonas*, and named *Herpetomonas ichneumonis*. The organism is found in the alimentary canal, where it undergoes three phases of development. It is first a small ovoid body, possessing a large and a small nucleus, and resembling the Leishman-Donovan body, the pathogenic agent of the Indian disease, Kala-azar. This form is known as the pre-flagellate stage. As it grows in the mid-gut of the Ichneumon, the body elongates and forms a long flagellum, so that the organism now has a vermiform or snake-like body with a single flagellum at one end. The flagellum executes vigorous lashing movements, and the organism as a whole moves in jerks. As it reaches the hind-gut, where the contents are more concentrated, the parasite absorbs its flagellum, becomes oval again, and forms a thickened wall or coat around itself. Thus encystment occurs. The cysts or post-flagellate stages pass from the insect's body in the fæces, and are well adapted for extra-corporeal life until they are ingested by a new Ichneumon, when the cycle commences again.

IS *TINEA PALLESCENTELLA* GRANIVEROUS?—When Stainton in 1851 described *Tinea pallescens* (Sup. Cat. p. 2) from a specimen

sent to him by Gregson, he hazarded no opinion as to the food of its larva, but in his further reference to the species in 1857 he says "larva granivorous" (Ent. Ann. 1857, p. 122). Gregson, in 1856, had described a species that he had reared from "rubbish-sweepings" from the Liverpool Dock warehouses under the name of *Tinea nigri-foldella* (Zool. p. 5295); but this we now know to be synonymous with *T. pallescens*. Eales reared the species freely from a dead and desiccated cat (Ent. Mo. Mag. vol. viii. p. 209). Merrin tells us that the larva is found in hare, rabbit, and cat skins, and that the moth frequents poulterers' shops (Lep. Cat. ed. 2, pp. 55, 133, &c.). R. C. R. Jordan records that the only time he found the moth plentiful was in a hairdresser's room (Ent. Mo. Mag. vol. xxv. p. 212). I have myself reared it from larvæ feeding in bags of hares' hair, and frequently taken the moth in my house. Of what Gregson's "rubbish-sweepings" consisted it is now impossible to say, nor do we know whether Stainton had any information regarding the habits of the larva beyond what it may be assumed Gregson supplied; but it will be noted that the recent definite records all give the larva as feeding on animal products, and the situations where the imago has most frequently been met with of late seem to point in the same direction. Perhaps some other entomologists may have had different experiences; may even have reared the species from grain or other vegetable substance. If this should be the case, and they would publish their experiences, they would be throwing light on the economy of a species that might in certain circumstances be exceedingly useful.—ROBERT ADKIN; Lewisham, March, 1913.

CENONYMPHA TIPHON IN NORTH WALES.—I was not aware of the supposed rarity of this insect in North Wales until reading Mr. J. Arkle's interesting paper in the 'Entomologist' for March (*ante*, p. 91), but I may say that in July, 1906, I saw it several times, and took more than one specimen to make sure of identification, on the moors above the north-west end of Bala Lake, in Merionethshire, where it did not appear to be very uncommon. I think it was met with on more than one of the moors thereabouts, and that I also saw it in the previous year, but one exact locality is a low, flat, and boggy bit of ground on the lower slopes of Arenig Fawr, known as "The Lordship," a mile or two above Sir Williams Watkin Wynn's seat at Glan Llyn. This cannot be very far, as the crow flies, from Mr. Arkle's station, but the new locality may be worth putting on record. In reference to the concluding remark in his paper, I may add that *C. pamphilus* likewise occurs on these Bala moors, usually in profusion, and in pretty close proximity to its larger congener. I have also taken the two species together on several of the Northumberland and Berwickshire moors.—GEORGE BOLAM.

A SPRING MIGRATION OF PYRAMEIS CARDUI ON THE MEDITERRANEAN.—The first appearance of *Pyrameis cardui* in this country in a season in which it is abundant has been repeatedly noticed, and it seems to be always the same. One day in early summer an absolute absence of the species on the southern coast: the next day a more or less numerous swarm of specimens on the same ground, showing evident signs by their condition of having flown long distances; then



after another day or two the specimens all disappear. I have never, however, until this year seen a migration in southern latitudes, and was thus much interested to meet such an undoubted one in the South of France a few days ago. I was staying at Mentone during the last few days of March. On the 27th, 28th, and 29th the weather was perfect, with bright sun and without wind. During these days not a specimen of *P. cardui* was to be seen; on March 30th there was bright sun, with a very strong wind from the south-east, and the next day *P. cardui* was in numbers everywhere, the specimens in good condition, but considerably faded in colour. On April 1st there was an absence of sun, and on the 2nd, when the sun broke out, the *P. cardui* were all gone. In the event of the species appearing further north, it would be most interesting to have reports of their progress, with dates, if possible, of their first appearance in this country.—W. G. SHELDON; April 11th, 1913.

*EUCOSMIA UNDULATA* IN CUMBERLAND.—In regard to Mr. James Murray's note on *E. undulata* in the April number of the 'Entomologist' (*ante*, p. 140), I took a specimen for the first time on Hayton Moss on July 15th, 1912. The insect was flying at dusk, and is in fair condition. It is undoubtedly rare in the county of Cumberland.—GEORGE B. ROUTLEDGE; Tarn Lodge, Headsnook, Carlisle, April 3rd, 1913.

*EUPECILIA UDANA*.—I am thankful to Mr. Thurnall for his remarks about this species (Entom. xliii. 350). Following his hints, I collected last autumn a bundle of the stems of *Alisma plantago*, though without looking to see if there was anything in them, and, having kept them in a warm greenhouse instead of in the open, I have been rewarded by the emergence (1) of several ichneumons, and (2), to-day, of a charming specimen of *udana*, I hope the first of several.—(Rev.) W. CLAXTON; Navestock, Romford, April 5th, 1913.

"HYBERNATION" OF *PYRAMEIS ATALANTA*.—As there have been some notes in the 'Entomologist' *re* the above subject, perhaps it may interest some readers to know that during the winter 1912-13 I kept alive until late January a specimen of *P. atalanta*, which emerged from a pupa taken in August, near Sutton Coldfield, by a friend of mine, Miss E. Twilton. About January 28th the insect accidentally met its death, much to my regret. I fed it on honey and water twice a week, which food it seemed to appreciate. The butterfly was kept in a good-sized box with a glass top, in a cold bedroom where it had no artificial heat, but a little sunshine at times.—ERIC BIDDLE; "Selborne," Western Road, Wylde Green, Birmingham.

[The above note is interesting, not that it in any way lends support to the opinion that *P. atalanta* is a hibernating species, quite the contrary, but because it confirms previous records of this butterfly being kept alive during the winter months in this country. Mr. Newman conclusively proved this fact in 1909-10 when he confined seven specimens, kept them in a temperature that never fell below 35°, and provided moistened cane-sugar for their sustenance (Entom. xlv. 99). As some of the butterflies under his observation lived for eight or nine months, we have evidence of the longevity of autumnal



imagines of the species. However, as all the butterflies were active throughout the winter, the term hibernating in its true sense would not apply to them. What we now want are some experiments to test the vitality of *P. atalanta* under circumstances as nearly identical as possible with those the butterfly would have to endure in a state of freedom in the warmer parts of Britain during the winter months.—ED.]

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 5th, 1913.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—The President announced that he had nominated as Vice-Presidents for the ensuing session the Rev. F. D. Morice, M.A., and Messrs. J. E. Collin and J. H. Durrant.—Mr. A. E. Gibbs exhibited a number of insects, principally Syntomid moths, from British Honduras.—Mr. Donisthorpe, males and workers of *Formica fusca* var. *picea*, Nyl., from the New Forest, and a female from Belgium, and pointed out that it was standing in the British lists as *gagates*, Latr. He gave a history of var. *picea* as British, and exhibited workers and a female of the true *F. fusca*, subsp. *gagates*, Latr., from Vienna, and pointed out that *gagates* has not occurred in Britain.—Mr. A. J. Richards, who was present as a visitor, several very scarce Coleoptera, chiefly from Hindhead.—Mr. W. A. Lamborn, cocoons of *Deilemera antinorii*, Oberth., from the Lagos district, together with the moths that emerged from them.—Mr. J. A. de Gaye, F.L.S., who was present as a visitor, five males and eight females of *Gonometa subfacia*, Walker, which came from Lagos, S. Nigeria. Mr. de Gaye explained how the males were captured while they were trying to get into the breeding-cage in which were two newly-hatched females. Prof. Poulton observed that Dr. Lamborn's previous experiences had made it almost certain that in spite of the great difference in size and appearance these insects were the male and female of the same species, but that Mr. de Gaye's experience had now placed the matter beyond doubt.—Prof. Poulton, a *leighi* female of *Papilio dardanus*, Brown, together with one *trophonius*—two members of a family bred by Mr. G. F. Leigh, from a female parent of the latter form. He also exhibited two further sets of parent and offspring of synepigonic *Pseudacraeas* of the *Eurytus*, L., group, bred by Dr. G. D. H. Carpenter on *Bugalla*, in the Sesse Archipelago.—Mr. B. Harold Smith, thirty-five specimens of *Phryxus livornica*, taken at light in South Cornwall during the last half of May, 1912.—Mr. A. Bacot, a probable gynandromorph of *A. virgularia*, having the right wings melanic, the left wings of normal grey coloration.—Mr. N. D. Riley, on behalf of M. André Avinoff, a collection of Rhopalocera, made on a journey in the Western Himalayas. M. Avinoff, who was present as a visitor, gave an account of his expedition.—The following paper was read by Commander Walker:—"Trichogramma, Westw., probably Synonymous with *Pentarthron*, Riley (Hymenoptera)." By R. C. L. Perkins, M.A., D.Sc., F.Z.S.

*Wednesday, March 5th, 1913.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—The following were elected Fellows

of the Society:—Miss Blanche A. Coney, The Poplars, Pucklechurch, Glos.; Messrs. Lachlan Gibb, 38, Blackheath Park, Blackheath, S.E.; Gerald F. Hill, Govt. Entomologist, Northern Territory, South Australia, Port Darwin, N.T.S.A.; Lowell Mason, 22 and 23, Club Arcade, Durban, Natal. It was announced that the Council had nominated Messrs. J. H. Durrant, L. B. Prout, and C. O. Waterhouse, to act as the representatives of the Society on the National Committee on Nomenclature. The Council also recommended the appointment of a permanent Nomenclature Committee for the Society itself, and suggested that it should consist of the three representatives of the Society on the National Committee, the British representative on the International Committee, the Secretary of the Society, and two elected members; the Council also proposed the names of Mr. G. T. Bethune-Baker and Dr. K. Jordan as the elected members. No alternative was suggested, and the recommendations of the Council were unanimously adopted. The present Committee of the Society therefore consists of the following Fellows:—Messrs. G. T. Bethune-Baker, J. H. Durrant, C. J. Gahan, Dr. K. Jordan, Messrs. L. B. Prout, C. O. Waterhouse, and the Rev. G. Wheeler.—The Hon. N. Charles Rothschild brought before the notice of the meeting a recently formed society—the Society for the Promotion of Nature Reserves, and briefly outlined its objects.—Mr. J. E. Collin, on behalf of Lt.-Col. C. G. Nurse, three specimens of a peculiar insect which Mr. G. C. Champion had identified as a species of *Myiodites*, a heteromerous Coleopteron, captured by Col. Nurse at Quetta (India) in 1902.—Mr. O. E. Janson, specimens of a curious form of staphylinid beetle from South Brazil, apparently the *Ecitomorpha arachnoides*, Wassm.—Mr. L. B. Prout, a series of *Larentia citrata*, L., from Iceland.—Dr. K. Jordan, a species of *Eurytoma*, an almond-feeding Chalcid, together with its live chrysalis, which he had received from Cyprus, where the species does extensive damage in the almond plantations.—Mr. R. Adkin, specimens of *T. pallescens*, that he had reared in January last from larvæ found feeding in a bale of hare's hair received from Brandon, Suffolk, in the previous November.—Prof. Poulton, examples of specimens belonging to various distasteful lepidopterous groups, exhibiting "disabling injuries."

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 26th, 1913.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. A. E. Gibbs exhibited butterflies collected in the Balkans in 1912, including *Pieris manni*, *P. ergane*, *Anthocharis belia*, *Pontia daplidice*, *Leptosia sinapis*, *Colias edusa*, and *C. hyale*, and aberrant forms of each species.—Mr. Colthrup, a specimen of *Vanessa io*, found hibernating in a room in Dulwich.—Mr. Tonge, a specimen of *Sphinx ligustri*, in which the pink coloration was replaced by white.—Mr. Turner, an aberration of *Melitæa didyma*, in which the black markings were for the most part of a pale slate colour, and various forms of the female of this species.—Mr. Frohawk, a bred series of *Lampides beticus* of unusually large size. The larvæ fed upon green peas. He also showed drawings of the protective resting positions of various species of Lepidoptera.

March 13th, 1913.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. A. E. Gibbs, of St. Albans, Mr. Geo. Brooks and Mr. Gilbert Storey, of the British Museum (Nat. Hist.), were elected members.—Mr. Tonge exhibited living larvæ of *Epunda lichenea* and of *Aplecta occulia*.—Mr. Colthrup, some excellent photographs of well-known collecting localities, and of the resting positions of various species of the genera *Tephrosia* and *Boarmia* showing protective resemblance.—Mr. C. B. Williams, larvæ of the Snakefly, *Raphidia notata*, which has occurred not uncommonly in pine stumps at Oxshott. It fed readily on aphides.—Mr. Platt Barrett, specimens of the true *Thera variata* from the New Forest, where the larvæ occurred on spruce.—Mr. Gough, a blackbird's egg having the markings massed at the larger end.—Mr. Brooks, the larva of *Geotrupes stereorarius* found under a rubbish heap.—Mr. A. E. Gibbs, the Satyrids and Hesperids taken by him in his trip to the Balkans in 1912, and contributed notes on the occurrence and variation of the various species.—Mr. R. Adkin, a series of *Tinea pallescentella*, and read a short paper on its history as a British species, and discussed his experience in rearing it.

March 27th.—The President in the chair.—Mr. B. H. Smith gave two specimens of *Phryxus livornica* to the Society's collection.—Mr. R. Adkin exhibited several specimens of *Crymodes exulis* from Shetland and from Inverness to show the characteristics of the two races.—Mr. A. E. Gibbs, a number of Nymphalids, especially of the genera *Argynnis* and *Melitæa*, taken by him in the Balkans in the summer of 1912, including *Dryas pandora*, *Argynnis adippe* ab. *cleodoxa*, *Issoria lathonia*, *B. hecate*, *Chrysophanus alciphron*, *Melitæa trivialis*, *M. athalia* var. *mehadensis* and ab. *navarina*, *Libythea celtis*, *Neptis lucilla*, *Polygonia egea*, &c.—Mr. J. Platt Barrett, a number of species of Sicilian butterflies, including *Melanargia japygia*, *M. pherusa* and var. *plesaura*, *M. galathea* and vars. *lucasi*, *procida* and *syracusana*, and discussed other allied forms; he also showed a series of *Euchloë damone*.—Mr. W. J. Kaye exhibited the pupa of *Lycæna arion* found by Mr. Percy Richards in 1908 in an ant's nest in a frail cocoon.—Mr. F. W. Frohawk a form of *Euchloë cardamines*, in which the discoidal spots of the fore wings were considerably within the orange apical area.—HY. J. TURNER, *Hon. Rep. Secretary*.

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—February 5th, 1913.—The evening was occupied by a number of small exhibits.—Mr. B. H. Crabtree showed a melanic form of *Acidalia virgularia* from London, and also the type; he showed also three specimens of *Lycæna astrarche* var. *artaxerxes* from Aberdeen, which were largely without the white spots underneath.—Mr. R. Tait, Jun., showed a long series of *Agrotis ashworthii*—the pick of a number of years' collecting. He mentioned that on January 4th, at Penmaenmawr, he found two larvæ of *Agrotis strigula*, and traces showing that they had recently been feeding; frozen snow was on the ground.—Mr. W. Mansbridge exhibited male, female, and case of *Epichnopteryx pulla* from Penmaenmawr and Delamere.—Mr. J. Mangan showed living newly-emerged examples of *Ptinus tectus* from almonds. He remarked that this injurious beetle was establish-



ing itself in Britain. Living larvæ of a species of *Telephorus* from Fallowfield, Manchester. Living larvæ of a *Simulium* taken from a brook at Gatley, Cheshire, in January, 1913. Living larvæ of *Phalacroceræ replicata* (an aquatic Tipulid) found in moss at Princall, Chorley, Lancashire.—Mr. J. H. Watson showed *Attacus lorquini* from the Philippines, and *Coscinocera hercules* from N. Australia; also preserved larvæ living under protective cases of *Cicinnus despectris* and *Oiketiscus kirbyi*, from Buenos Ayres, early in 1912.—Mr. A. W. Boyd exhibited sundry Micro-lepidoptera from Platt Fields and Boggart Hole Clough, two of the Manchester public parks, which included *Scardia cloacella*, *Tinea fulvimitrella*, *Dasycera sulphurella*, *Stigmonota regiana*, *Laverna atra*, *Hedya neglectana*, *Prays curtisellus*, *Argyresthia pygmaella*, &c. He also showed short series of *Mesoleuca bicolorata*, *Lomaspilis marginata*, *Asthena luteata*, *Euchœca oblitterata*, *Nola cucullatella* and *Cilix glaucata* from various Cheshire localities, and *Perizoma blandiata* from Cumberland.—Mr. A. E. Salmon showed a female *Sirex gigas* from a Barrow works, and a piece of lead (7 mm. thick) through which it had made its way; previous to boring through the lead it had bored through a board. He quoted various records of this insect's boring powers.—A. W. BOYD, M.A., *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquh St., Liverpool, March 17th, 1913, Mr. F. N. Pierce, President, in the chair.—Professor Robert Newstead, F.R.S., M.Sc., of the Liverpool School of Tropical Medicine, delivered a lecture entitled "The Bionomics and Morphology of some Bloodsucking Flies." Mr. Newstead dealt in his usual lucid and thorough manner with the life cycle of representative species of the genus *Glossina*, or tsetse flies, which convey sleeping sickness to man and "ngana" to cattle, the species incriminated being *Glossina morsitans* and *G. palpalis*. The lecturer also described *Stomoxys calcitrans*, a world-wide species and a common stable fly in Great Britain, which is strongly suspected of being concerned in the transmission of trypanosomes. A very interesting life-history was that of *Simulium*, whose larvæ live in rapidly running, shallow streams; and, lastly, the minute midge, *Phlebotomus papatasi*, Fam. Psychodidæ, found commonly on the Mediterranean littoral and elsewhere in subtropical and tropical countries, which carries the "three days" fever from sick to healthy persons, was described. Mr. Newstead, having visited many different parts of the world to investigate the life cycles of these insects, and having himself discovered many important facts concerning them, he was able to give a vividness to his remarks that no mere book knowledge could have done. The lecture was illustrated by blackboard drawings and microscope preparations showing the structure and anatomical details of the insects mentioned above. Further exhibits by Mr. Newstead were two specimens of *Glossina severini*, Newst., a new species recently recognized from the Congo Free State, and a specimen of the very rare *G. fuscipleuris*, Austen; also a wasp, *Bembex forcipata*, that had only recently been found to store its larva cells with the tsetse fly; this exhibit comprised nine



flies from a single cell together with the wasp. The university collection of bloodsucking flies was also on view, containing practically all the known species and many types.—Mr. F. N. Pierce exhibited the genus *Acidalia* as at present arranged, and also as it falls into two distinct groups when classified according to the genitalia.—Mr. C. E. Stott sent for exhibition a specimen of *Thyreocoris scaraboides*, a chalk hemipteron picked up on the shore at Blackpool.—WM. MANSBRIDGE, *Hon. Sec.*

## RECENT LITERATURE.

*Catalogue of the Lepidoptera Phalænæ in the British Museum.*  
Vol. xii. By Sir GEORGE F. HAMPSON, Bart. Pp. i.—xiii. and 1–626. London: Printed by Order of the Trustees. 1913.

THIS volume, the 12th of the Phalænæ, and the 9th dealing with the Family Noctuidæ, treats of a portion of the Catocalinæ. The remaining species of this Subfamily and those belonging to the Subfamilies Mominæ and Phytomatrinae will form the subject-matter of volume 13. Classification of the Subfamily Noctuinae will be commenced in volume 14.

Sixty-three genera (15 new) and six hundred and forty-three species (71 new) are entered, and fully described, in the present volume.

The six genera noted below have over thirty species each, and collectively they embrace rather more than half of the entire number of species considered—*Catocala*, Schrank (86 species), *Parallelia*, Hübn. (85 species), *Ephestia*, Hübn. (63 species), *Achæa*, Hübn. (50 species), *Anua*, Walk. (46 species), *Catabapta*, Hulst (31 species).

Roughly estimated, over two hundred species have hitherto been referred to the genus *Catocala* of authors, but, as indicated above, only eighty-six are here retained in *Catocala*, Schrank; the largest number being allocated to other genera as follows:—*Catabapta*, Hulst (*t. antinympha*, Drury), 31 species. *Mormonia*, Hübn. (*t. epione*, Drury), 16 species. *Ephesia*, Hübn. (*t. fulminea*, Scop.) 64 species.

*Maxula*, Walk. (*t. unstrigata*, Guen.) and *Pyramarista*, Kirby (*t. rufescens*, Kirby) are merged in *Eumonodia*, Walk. (*t. pudens*, Walk.); whilst *Spirama*, Guen. (*t. suffumosa*, Guen. = *retorta*, Cram. nec Linn.), and *Hypopyra*, Guen. (*t. triloba*, Guen.) are sunk in *Speiredonia*, Hübn. (*t. retorta*, Linn.).

Only thirteen species are retained in *Ophisma*, Guen. (*t. gravata*, Guen.), a number of species placed in *Ophisma* by Guenée, Walker, and others being referred to *Achæa*, Hübn. (*t. melicerta*, Drury).

The majority of the species here assigned to the genus *Parallelia*, Hübn. (*t. bistriaris*, Hübn.) were originally described in *Ophiusa*.

*Minucia*, Moore (1884), replaces *Ophiodes*, Guen. (1841), as the latter name is preoccupied in Reptilia. Only two species are included in this genus—*lunaris*, Schiff., the type, and *wiskotti*, Püng.

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## A NEW GALL-INHABITING EULOPHID GENUS FROM QUEENSLAND, AUSTRALIA.

By A. A. GIRAULT.

HYMENOPTERA CHALCIDOIDEA.

Family EULOPHIDÆ.

Subfamily ELACHERTINÆ.

Tribe ELACHERTINI.

*ZAGRAMMOSOMOIDES*, new genus.

*Female*.—With all of the characters of its subfamily and tribe as defined by Ashmead in 1904.

Allied with and resembling *Zagrammosoma*, Ashmead, but more robust, the wings hyaline, the head not thin, not wider than long but triangular, the scutellum with four longitudinal grooved lines, the antennæ ten-jointed with two-ring joints, the abdomen transversely banded. Separated from the other genera in bearing an additional ring-joint in the antennæ, the longitudinal thoracic grooves and in cephalic characters. The thorax is noteworthy because of the very long scutum, which is twice the length of the scutellum, the latter bearing two longitudinal grooved lines along each side. Mesonotum without a median groove. The abdomen is stout, sessile, ovate, subequal in length to the head and thorax combined, the ovipositor not exerted. The fore wings are large, with a short marginal fringe and normal discal ciliation, the postmarginal vein only slightly developed but distinct, the stigmal vein two and a half times longer, the marginal longer than the submarginal. The antenna has a well-defined club which is ovate and three-jointed, the three funicle joints are each much smaller than the pedicel and subquadrate; scape long and stout. The pronotum lengthens considerably on each side. Genal sulcus long and distinct. Antennæ inserted on a line with the ventral ends of the eyes. Metathoracic spiracle oval, moderate in size. Propodeum with a short, slight, median carina, but with no others. Mandibles three-dentate, the two outer teeth acute.

*Male*.—The same, but the pedicel is a little longer, the club shorter, the abdomen shorter and depressed (in death), the same, or nearly, but in life a little less acute at the apex.

*Type*.—The following species.

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1. *Zagrammosomoides fasciatus*, sp. n. (normal position).

*Female*.—Length about from 2–2.50 mm. General colour flavous, the eyes red, the wings hyaline, the appendages and venation colorous. Conspicuously marked with black as follows: in the dorsal aspect the abdomen is banded across the posterior margins of the segments commencing at base, there being six transverse stripes which lengthen (widen) distad, or else the middle ones are broader.\* The propodeum is black; also the pronotum cephalad in the dorsal aspect on each side of the median line, appearing like two large cuneate spots; a large ovate spot in the centre of the mesoscutellum, an ovate spot on each side of (not upon) the scutum, in the cephalic angle of each axilla, and a smaller spot at the caudo-lateral angle of the pronotum. Cephalad in the disk, the scutum is distinctly stained except along the median line; each parapside is similarly stained, and also the vertex may be so, here the stained area projecting into the face (cephalic aspect) like wedges on each side. The ocelli are in a nearly straight line across the vertex. The antennæ are suffused with dusky, as are also the femora of the legs, more or less. The proximal club-joint is nearly half as long as the entire club. Whole body finely, polygonally reticulated, the vertex and face with more or less obscure umbilicate punctures. (From many specimens,  $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.)

*Male*.—Somewhat smaller; the same, but the dark areas on the cephalic part of the scutum usually black and nearly coalesced; the abdomen bears only five transverse stripes which lengthen (become thicker) caudad, the second concaved at the meson, the fifth twice longer than the fourth, none of the distal four stripes with parallel margins. (From numerous specimens, similarly magnified.)

Described at first from ten males and sixty-two females reared from a single globular green gall from the foliage of bloodwood gum (forest), Nelson, North Queensland. The gall measured 1.2 cm. diameter, and was blushed with pink. It was obtained on August 22nd, 1912. When cut into halves the naked pupæ of this eulophid were exposed, arranged in a flat layer circularly disposed about a common line-like centre. Emergence commenced on August 23rd, and became general three days later, when the whole periphery of the gall became punctured with the minute exit-holes, as though it had been used some time for a pin-cushion. When approaching full development the white pupæ first show the black markings, the yellow appearing last.

Subsequently reared in enormous numbers from similar galls measuring 1.6 cm., the first two weeks in September.

*Habitat*.—Australia: Nelson (Cairns), Queensland.

*Types*.—No. Hy/1169, Queensland Museum, Brisbane; two males, two females, mounted on card points, two pins.

This eulophid *appears* to be a true gall-making species.

\* The penultimate stripe prolonged caudad at meson, the ultimate thin, the first concaved along the cephalic margin. There is some variation in these stripes.

## A NEW MOSQUITO FROM NORTHERN CHINA.

BY FRED. V. THEOBALD, M.A., F.E.S., &amp;c.

A SMALL collection of Culicidæ sent me by Dr. Brouquet, of Tien-Tsin, contained a long series of *Myzorhynchus sinensis*, Wiedemann, showing considerable variation in size, but most constant in markings; a single female of *Culex biroi*, Theobald; and a female of *C. pseudoinfula*, Theob., and an undescribed species, which I have called *Grabhamia broquetii*. They were all taken in the Arsenal de l'Est, Tet-chili, North China.

*Culex pseudoinfula*, Theob., I described from Pasuruan, Java and Samarang; the type is in the Amsterdam Museum.

*Grabhamia broquetii*, nov. sp.

Head pale golden, brownish at the sides. Proboscis pale golden, black at the apex and base; palpi dark, mottled with pale golden scales; clypeus black. Thorax pale golden, with a median rich chestnut-brown line and a similar coloured area in front of the wings at the sides. Abdomen mostly white scaled, but with four pairs of black quadrangular marks, decreasing in size from the base apically. Legs golden yellow, with black tarsi, with narrow apical and basal creamy bands, last hind tarsal creamy white, last tarsal of fore and mid legs clay coloured. Wings with mottled scales, the first, third, and fifth veins black scaled and the branches of the fourth mostly dark scaled.

♀. Head dark brown, clothed with rather long pale golden to almost creamy narrow-curved scales in the middle, flat rich golden ones at the sides and a small area in front, between the flat and narrow-curved scales, of very small rich golden scales; upright forked scales on mid head pale creamy yellow, a patch of black ones on each side, giving the general brown lateral appearance when viewed with a lens; a tuft of long pale scales projecting forwards between the eyes; chætæ golden in the middle, darkened laterally; eyes coppery red to black.

Antennæ brown; basal segment and second paler, the former with many flat creamy scales; hairs brown. Clypeus dark. Proboscis golden scaled, dark at the apex and base, somewhat mottled. Palpi golden yellow, mottled with black scales, apex pale creamy yellow, chætæ dark.

Thorax dark brown, shiny, clothed with pale golden narrow-curved scales, becoming paler behind, and with a moderate sized median line of rich reddish to chestnut-brown scales, and a similar coloured area in front before the wings; chætæ brown and pale golden. Scutellum pale brown, with narrow-curved pallid scales and brown and golden posterior border bristles, which are numerous on the mid-lobe; metanotum pale brown. Pleuræ densely clothed with flat white scales.

Abdomen densely clothed with flat white scales, the second, third, fourth, and fifth segments with a pair of black scaled areas, roughly quadrangular in outline; a few scattered black scales on the last two



segments; basal segment white scaled; hairs pallid; venter entirely white scaled.

Legs pale golden (in one specimen almost creamy), a few scattered dark scales on the femora; the tarsi dark scaled with narrow apical and basal pale bands, metatarsi all pale scaled; last fore and mid tarsal segments appearing pale, but there are traces of dark apical scales; last hind tarsal white; claws dark, all uniserrated; chaetæ brown and golden brown; one specimen shows a few scattered dark scales on the tibiae and apex of the metatarsi.

Wings with creamy and dark scales; the first long vein with flat dark scales, with a few scattered pale ones, the second pale scaled, with long lateral vein-scales, some slightly dusky; third with flat black median scales and scanty, dusky, long, lateral vein-scales; fourth pale scaled, with long lateral vein-scales, except on the apical half of the outer branch, where there are broad and dark scales and on nearly all the inner branch; fifth vein all dark scaled, scales broad and flat; sixth with long thin pale scales; first fork-cell longer and narrower than the second, its base a little the nearer to the base of the wing, its stem not quite as long as the cell; posterior cross-vein about its own length distant from the mid cross-vein.

*Length*, 5 mm.

*Habitat*.—Tet-chili, North China; Tamsui, Formosa.

*Observations*. — Described from three females sent me by Dr. Broquet.

It is a very marked species, with a general resemblance, however, to *sollicitans*, Walker. It can be told by the thoracic adornment, apical and basal leg-banding, and the marked wing and abdominal ornamentation. The colour of the eyes is different in all three specimens—in one black, another coppery red, and the third silvery.

The damaged specimen I recorded with a query as *sollicitans*, from Formosa (Mono. Culicid. i. p. 369, 1901), was evidently this species, as I have since received a specimen from that island that exactly agrees with Dr. Broquet's specimen.

*Types* in the writer's collection.

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## BRITISH ODONATA IN 1912.

By W. J. Lucas, B.A., F.E.S.

IN 1912 the dragonfly season commenced early. I met with the first example in the New Forest on April 19th. Though not properly identified, it was no doubt a *Pyrrhosoma nymphula*. Two days later three more were seen, also in the New Forest. On the 28th of the same month *P. nymphula* was fairly common, though still in the teneral condition, at the Black Pond in Surrey, where also a teneral *Libellula quadrimaculata* was captured.

In the Broads, too, dragonflies were found to be rather early by Mr. G. T. Porritt. Writing June 11th, he says:—"I spent Whit Week at the Norfolk Broads, but found *Agrion armatum* very scarce. Indeed I took only four (three males and one female) all the week, and saw perhaps six or eight more. I rather think I was too late for it this early season, as it was probably well out during the hot weather we had at the end of April. Even *A. pulchellum*, usually the commonest dragonfly of the Broads, seemed in much reduced numbers and going over. *Libellula fulva* was common, but the specimens I netted—of both sexes—were immature, as probably most, if not all, were. I certainly did not see a single adult blue male; but one cannot well work for *L. fulva* and *A. armatum* at the same time. The commonest dragonfly in the Broads was *Erythromma nias*, which abounded and was on the wing all day up to 7 o'clock in the evening, when there was any sun."

Mr. Corbett, on Whit-Monday, visited Askern in Yorkshire, one of the older localities for *L. fulva*, and found the species common, but all the specimens teneral.

Mr. O. Whittaker found *Ischnura elegans* abundant during May on the canal between Droitwich and Salwarpe, in Worcestershire—the only dragonfly in evidence there. He also found in May *Calopteryx splendens* on the Severn at Holt Fleet, in Worcester. At Studland, Dorset, Col. Yerbury took *I. elegans*, female, var. *rufescens* on May 8th and *Enallagma cyathigerum*, males, on the 11th and 12th.

Mr. S. A. Blenkarn met with the following species in the Isle of Wight, the dates given being those on which the various species were first seen:—" *Libellula depressa*, one male, at a pond on Sandown cliffs, May 26th; and at Brading Marshes on the 28th. *Brachytron pratense*, common at Sandown Marshes, May 18th. *Calopteryx virgo*, one, Brading Marshes, May 28th (new to the Isle of Wight list). *C. splendens*, one male, Sandown Marshes, May 24th; two males, Brading Marshes, May 28th. *I. elegans*, common, Sandown Marshes, May 18th. *P. nymphula*, a few, Sandown Marshes, May 25th. *Pyrrhosoma tenellum*, a few, Sandown Marshes, May 28th. *A. pulchellum*, a few, Sandown Marshes, May 25th. *E. cyathigerum*, common, Sandown Marshes, May 18th." I took *P. tenellum* myself on June 9th at the Black Pond.

Writing from Bournemouth, Mr. E. J. B. Sopp said:—"I found *C. splendens* common at Throop in June, but *I. elegans* was not nearly so common in the district as in 1911. At Littledown, in June, *Anax imperator* and *E. cyathigerum* were common after the middle of the month (I did not go there before). Mr. Kenneth Ryde told me of a big dragonfly that was common along the river Bourne (towards Westbourne) near the end of July. I asked him to catch one, and it turned out to

be *Cordulegaster annulatus*. There were fewer dragonflies at Hengistbury (up to mid-July) this year than last. *E. cyathigerum* was also common at Christchurch on July 9th."

By the side of the Great Ouse at Bedford, I captured *I. elegans* and *C. splendens* on July 7th.

On the Essex coast Col. Yerbury took:—*Sympetrum sanguineum*, six, scarcely mature in colouring; one male and female, July 4th, at Frinton-on-Sea; two males and female, July 13th, at Frinton-on-Sea, when the species was in some numbers, many being *in coitu*; one male, July 9th, at Walton-on-Naze, at a bed of *Carex* under the sea-wall. *Lestes sponsa*, male, July 5th, at Walton-on-Naze; one male, July 13th, at Frinton-on-Sea. *I. elegans*, nine, at Frinton-on-Sea, July 4th, three males and six females; one male was still holding its prey, a small



W. J. Lucas photo.

( $\times 3$ .)

*Ischnura elegans*, with fly in its grasp.

fly, in its legs used as a trap\* (see figure); two of the females were of the var. *rufescens*, and one had a tendency in that direction. *Agrion puella*, two males on July 4th, at Frinton-on-Sea.

From July 27th to September 9th I was in the New Forest where I met with the following fifteen species:—*Agrion mercuriale*, *Colopteryx virgo*, *Platynemis pennipes*, *Sympetrum striolatum*, *S. scoticum*, *Orthetrum cærulescens*, *Æschna cyanea*, *Ischnura elegans*, *Pyrrhosoma tenellum*, and its var. *melanotum*, *Æschna mixta*, *P. nymphula*, *Agrion puella*, *S. fonscolombii*, *Enallagma cyathigerum*, and *Cordulegaster annulatus*. This last I saw only on September 7th—a single specimen which I could not capture. As this is usually one of the commonest of the

\* I presume the fly may be looked upon as the dragonfly's prey, although Col. Yerbury did not notice its presence when putting his capture into the cyanide bottle.

summer dragonflies in the New Forest, its failure in 1912 is somewhat remarkable. I did not meet with *Ischnura pumilio*, but that may possibly have been over, and the same must be said of it for the corresponding period of the previous year. As late as August 29th I met with a recently emerged *S. scoticum*, and found the empty nymph-skin close at hand.

On August 9th I went to the pond in the New Forest, where I captured *Sympetrum fonscolombii* in 1911. I could not find it, but there were scarcely any dragonflies at the pond, the wind being rather high and somewhat cool. On the way thither I captured, however, a female *S. fonscolombii*, which had a rosy blush to the abdomen. There was a chip out of its rather glossy wings; otherwise it was in good condition. It appears certain that there was an immigration of this species into Britain in 1911; but what was the origin of this female? It was taken home alive. There I held it by its wings and allowed the extremity of the abdomen to dip into a watch-glass of water. Very soon it commenced egg-laying, and I obtained a large number. A few were put in formalin and water for examination; the rest I reserved to see if they would hatch, hoping, if they did so and thrive, to get imagines in 1914.

When first laid on August 9th the eggs were whitish in colour. On August 11th most had become yellowish, and perhaps they were fertile, while the unchanged ones were not. Though when first laid the eggs appeared to be quite free and mobile, there was on August 21st, and had been for some time, a film containing them and attaching them lightly to the bottom of the vessel in which they had been placed. At the same time it kept them separate from one another, and no doubt would serve on occasion as a means of protection from injury. Perhaps this film may swell up after oviposition, as in the case of frog-spawn. The eggs are nearly elliptical in section (see figure) the longer axis being  $\cdot 5$  millimeters or a trifle over, the minor axis being about two thirds of the longer one. One apex of the egg is a trifle more pointed than the other, and at this more pointed end is what looks like a small pedicel, but which may perhaps be connected with the micropyle. The slightly granulated surface does not show markings of any kind. Several almost transparent little nymphs had come out by the morning of September 4th, and probably had hatched that morning. I could see nothing of a pellicle surrounding any of them: all their legs seemed to be free. Others came out for a few days, till eventually there were quite a large number. The little nymphs swim quite freely with the help of their legs, moving forward in awkward zig-zag jerks. When they rest, their mid-legs are



Egg of *Sympetrum fonscolombii*  
( $\times 60$ ).



practically in a straight line, at right angles to the body. They were put into water from amongst the vegetation of a ditch, containing a quantity of minute life. In the morning of September 7th I saw two coming out of the egg, but could not detect the skin containing them. As, however, they seemed to be hampered in their movements, no doubt it was present. I am afraid none have survived. I saw one alive on October 27th, but previous to that had not seen one for a week or two, and I have seen none since.

Mr. F. H. Haines, of Winfrith, Dorset, writes to me as follows with regard to captures that he made of *S. fonscolombii* in 1912:—"On July 15th last the crimson colour of some dragonflies on a large heathland pond, north of Wareham, attracted me. Though excessively wary, their numbers made captures a mere matter of minutes and patient stealth. I was not collecting Odonata only, so after taking eight specimens (seven males and one female, the latter *in cop.*) we passed on. The wing nervures in the female specimen were not nearly so red as in the males taken, but it was teneral. *S. striolatum* was present, but in far less numbers than the rarer species, many of which looked very immature. My impression was strong that they had been bred there, perhaps exceptionally through the heat of 1911. Females were apparently in some numbers, even after deducting a proportion as really females of *S. striolatum*, or immature males of either species. Except that they are less autumnal insects, and keep nearer open water, their habits seem precisely those of *S. striolatum*. They would settle on the edges of the lake, on the tops of rushes growing in or round it, or amid the heather near the waterside. On July 27th I also saw many specimens over, and just round, a large pond on a heath near Warrawell. As before their condition was very bright and fresh, and I believe both sexes were present. I took a single male only for purposes of identification."

On September 9th Mr. Porritt found *S. striolatum* abundant at various places on the Lincolnshire coast—Sutton-on-Sea, Trusthorpe, Mablethorpe, &c.

Writing from Coventry on September 16th, Mr. O. Whittaker said:—"Yesterday afternoon I saw a female *Æschna* (of which species I could not say) engaged in oviposition. She deposited her eggs in a floating leaf of *Potamogeton*, so that her abdomen was above the surface of the water; but as she clung to a submerged leaf her head, thorax, and wings were entirely beneath the surface. She remained in this position for considerably more than half-an-hour (I timed her), frequently moving her wings with great rapidity. She must have laid about twenty or thirty eggs in the one leaf. Unfortunately, as it was some seven or eight feet from the bank, I could not secure them. Besides the ovipositing dragonfly there was one

flying about, and some local boys said, 'There's a Hornet.' In Lancashire they are called 'Headers,' which in the dialect of that part is pronounced 'Yedders.'" On September 20th Mr. Whittaker went to the pond and captured a specimen (*Eschna cyanea*) which he sent to me alive.

Mr. F. W. Campion told me (September 24th) that Mr. Watts had taken *P. nymphula* var. *melanotum* this year at Byfleet. This is, I believe, the first record of this form of *P. nymphula* from Surrey.

On September 25th Mr. G. Bolam found a male *Eschna juncea* at rest on heather near the top of Cross Fell, in Cumberland. This he sent to me. In connection with this insect Mr. Bolam wrote (September 29th):—"But it occurs all along these hills and also in the Cheviots in Northumberland and Roxburghshire, commonly though not plentifully. Here it is now to be met with in twos and threes about most of the burn-sides and tarns. It is, perhaps, rather an upland species. On the 23rd I took one at rest, and saw others on the wing in both Cumberland and Durham across the watershed, between this place and Middleton-in-Teesdale."

Col. J. W. Yerbury took *S. striolatum* in Cornwall—at Lelant on August 24th; and at Downton on September 15th. He also captured at Lelant a teneral female specimen of *P. nymphula* on so late a date as August 22nd. Lt.-Col. C. G. Nurse tells me that he took *I. elegans*, male, at Timworth, May 11th, and, female, at West Stow, June 24th; *P. nymphula*, male, at Ampton on April 28th; *A. puella*, female, at Ampton, May 17th; and *E. cyathigerum*, female, at Ampton, April 28th—all in West Suffolk.

For myself the season of 1912 ended on October 6th, when I saw at the Black Pond, Surrey, *S. striolatum*, *S. scoticum* and an *Eschna*, which appeared to be *Æ. mixta*.

Kingston-on-Thames: April, 1913.

## NEW FOREST NOTES, 1912.

By G. T. LYLE, F.E.S.

WHEN compared with the preceding year, 1912 does not show to advantage either climatically or entomologically. July and August were wretchedly wet months with us, and probably this accounted for the comparative scarcity of our commoner butterflies.

In the previous autumn the larvæ of *Apatura iris* had been much more plentiful than usual, consequently it was not surprising that this fine insect turned up in some numbers in July, but, alas! in September and October the larvæ were not

correspondingly abundant, so that it seems likely that we shall see but little of our "emperor" for some few seasons.

On March 24th I noticed a specimen of *Pyrameis atalanta* flying in Irons Hill Enclosure, and on July 14th a perfectly fresh imago of this species was seen. During the past ten years at any rate the larvæ of *P. cardui* have never before been in such evidence. In June I collected many of the small caterpillars in the hope that I might breed parasites from them, but in this I was disappointed. A few full-fed larvæ were still about on July 14th, and a friend captured a freshly emerged imago on that date.

Perhaps the feature of the year was the great abundance of *Hemaris tityus* and *H. fuciformis*, particularly the latter. At rhododendron blossom this swarmed, so much so that a single collector captured ninety in two hours. Later on the ova were to be found commonly; on a small honeysuckle bush I counted more than thirty eggs, which would, I should think, be about half the total number on the bush. These I allowed to remain so that I might take the caterpillars later on, again with an eye to parasites. When next I visited the spot, however, some three weeks later, not a larva was to be found. No prowling entomologist, I am convinced, had robbed me, had he done so, he would have left traces, such as broken leaves, twigs, &c., for, as is well known, it is usual and convenient when collecting eggs or young larvæ of *H. fuciformis* to pick off the leaves to which they are attached. It was quite evident that the ova had hatched, for the curious round holes made in the leaves by the young larvæ were everywhere apparent. The disappearance may perhaps be accounted for by the fact that a few yards away was a large nest of *Formica rufa*. *H. fuciformis* was first reported to me as being out on May 9th, and I witnessed the capture of a specimen in good condition so late as July 7th.

*Phryxus (Deilephila) livornica* again visited us, Mr. E. Morris being fortunate enough to capture two, male and female, both, however, in poor condition. The female lived only a few days in captivity, laying a single egg before dying; this egg proved fertile, and the larva fed up well on vine, unfortunately succumbing in attempting to pupate.

Our forest burnet, *Zygæna meliloti*, was, as usual, plentiful in its favoured locality. This is a matter for congratulation, as the number of collectors who discover or are told of its haunt is yearly increasing. I have frequently noticed that this species does not fly much before midday.

Collectors who "assembled" for males of *Saturnia pavonia* had no lack of sport, the insects being very abundant. While in company with Mr. W. J. Lucas a female of *Boarmia cinctaria* was taken from a fence so early in the year as April 5th. Being confined in a chip-box, it had laid a number of eggs by the morning of the 7th, which duly hatched on May 1st. Several of



the small larvæ, which I placed on a plant of the common ornamental *Genista* growing in a pot indoors, thrived well, the first pupating on June 25th; when reared in this manner larvæ of *B. cinctaria* do not require a sleeve, as they never stray from the food-plant. Towards the end of April *B. cinctaria* was particularly plentiful, the favourite resting-places of the species during the day being the trunks of pine trees growing on the heaths.

Attached to the hairs on a small larva of *Macrothylacia rubi* found on July 6th were several tiny, vermilion, spider-like parasites; these did not seem to incommode the larva in any way, and with its first ecdysis after capture they disappeared.

In the early spring the abundance of the larvæ of *Boarmia repandata* was very remarkable—they might be picked up in dozens at night while feeding on heather, honeysuckle, &c., in the rides of the enclosures. In previous years I have noticed that some five per cent. of the pupæ produced the var. *conversaria*, but in 1912 I bred only one specimen of the variety from over one hundred pupæ.

Larvæ of *Hylophila bicolorana* were also more plentiful than usual; unfortunately the majority of them, at any rate in captivity, were stricken with a fatal disease, which first manifested itself in the shape of minute red spots on the body of the larva, gradually increasing in size until the creature presented a blotched appearance and in a few days became flaccid and died.

Another oak-feeding larva which turned up in some numbers was that of *Hadena protea*; it is certainly some years since it was so common with us. During August, September, and October the larvæ one usually meets with at that time of the year were very scarce; in fact, it was difficult to meet with anything excepting a few *Chimabacche fagella*.

As is well known, the full-fed larvæ of *Sarrothripa reveynana* may be found in June, I was therefore much surprised to "beat" a specimen on Sept. 4th; it pupated within a few days, and the imago duly emerged on Oct. 3rd.

As to insects of other orders, I find but few notes in my diary worth recording. On May 28th I noticed several *Osmylus chrysops* fluttering along under the banks of the Blackwater near Fletcher's Thorns, which is, I understand, a locality where they have been known to occur for some years past, and where larvæ have been found by Dr. D. Sharp.

Mr. C. B. Williams's notes on the life-history of *Raphidia maculicollis* (Entom. xlv. 1913, p. 6) greatly interested me, the more so as he was successful in rearing a parasite (*Pyracon melanurus*) from the larva. In describing the ova of *R. notata* (Entom. xli. 1908, p. 233), which appear to be very similar to those of *R. maculicollis*, I mentioned that the eggs I obtained were in contact one with another, as is the case with the ova of



*Sialis*, and had a very short pedestal at the thicker end on which they stood. Mr. Williams calls attention to the fact that the "pedestal" which he describes as a "globular appendage" is at the head end, and thinks that I must be mistaken in saying that the eggs stood on this end. He has had the advantage of seeing the ova when laid more naturally than was the case with the few I figured and described, which were deposited in a chip-box under anything but natural conditions. My ova were in a batch (five or six) as mentioned, and certainly rested on the thicker end, but, judging from the additional evidence we now have, this may have been an accident. Both *R. notata* and *R. maculicollis* in the imaginal state were particularly plentiful with us in 1912. On May 18th in Irons Hill Enclosure they could be beaten in numbers from the small oaks growing under the pines, as many as five or six from a single tree. Placing two dozen or so in three large pill-boxes, I was surprised on my return home an hour or two later to find the great majority dead or dying, the bottoms of the boxes being strewn with *débris* of legs, antennæ, &c. The few mutilated survivors were still fighting, the superior size of *R. notata* apparently not giving it any advantage over its smaller relative.

## ANOTHER ABNORMAL DRAGONFLY WING.

BY HERBERT CAMPION.

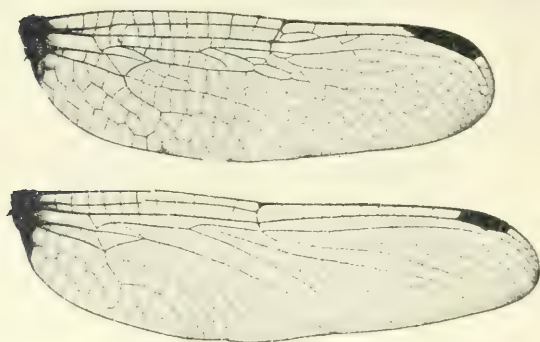


Photo F. W. Campion.

Hind wings of *Pornothemis serrata*, Krüg., ♂. Enlarged  $2\frac{1}{2}$  times. Upper figure—right wing (teratological). Lower figure—left wing (normal), seen from below.

THE teratological hind wing now figured belongs to a male of *Pornothemis serrata*, Krüg., from Borneo, and offers several

points of resemblance to the fore wing of *Libellula fulva*, Müll., of which photographs were reproduced in the March number of this magazine (Plate vii.). Thus, the wing is considerably shorter than it should be, and the homology of some of the longitudinal veins in the apical half is very obscure. The pterostigma is also greatly exaggerated, although it does not occupy more than one cell, and the subcosta affords another instance of prolongation beyond the nodus in the same sub-family (Libellulinae).

To facilitate comparison with a normal hind wing of *Pornothemis*, the under side of the left hind wing of the same individual is shown below the teratological wing, and it will be seen that in the last-named the triangle is modified in form and position, and that the anal loop takes on a distinctly Corduliine shape. Furthermore,  $M_4$ , until it ceases to be recognisable, runs nearly parallel with the radius, and the branches of the cubitus curve downwards less abruptly than usual.

The specimen in question was taken at Matang Road, Sarawak, in 1909, by Mr. J. C. Moulton, and was forwarded to me, for examination, by Dr. F. F. Laidlaw.

58, Ranelagh Road, Ealing: April 28th, 1913.

## FIVE MONTHS' BUTTERFLY COLLECTING IN COSTA RICA IN THE SUMMER OF 1911.

BY MARGARET E. FOUNTAINE, F.E.S.

THERE were two reasons why I went to Costa Rica, first, because the political situation in Mexico seemed leading on to conditions bordering on civil war, and secondly, owing to the fact that the cases of plague at La Guaira (the entrance port to Venezuela) seemed to be somewhat above the average; and so I went to Costa Rica. There I found a country abounding with butterflies, but most difficult to work, at least on the Atlantic side (which was practically as far as my experience extended), chiefly owing to the climate and the undeveloped conditions of the country. We had left a rather serious drought behind us at Kingston, Jamaica, here in Costa Rica to find a very persistent and perpetual rainfall. What wonder that the low, flat country round Limon was nothing but immense swamps, for the most part densely wooded, but quite impenetrable, through which indeed it was only possible to pass at all by following the railway tracks, as there are no roads whatever on the Atlantic side of this extraordinary country! Therefore the public thoroughfares are entirely along these railway lines, a system which naturally results in a good many deaths from misadventure, especially to animals, which are also allowed to feed freely on the rich, grassy

banks on either side of the track. Thick, impenetrable bush, all swamps beneath, skirt the greater part of these lines, and here the big, blue *Morphos* (*M. peleides*) fly fearlessly through the dense undergrowth, giving the breathless entomologist only a very meagre chance of effecting the capture of one of these magnificent creatures, as it flops across the track to pass from one snake-haunted bush to the other.

The snakes are very bad in Costa Rica, and we were constantly being warned to "be careful." A small and very beautiful scarlet and spotted species, commonly known as the coral snake, being especially dangerous—scarcely ever did anyone bitten by this venomous brute recover; and as for the blood snake, a rather larger species, dark crimson in colour, death with blood oozing from every pore of the body was the certain result of too close an acquaintance *there*! I only once saw one of these blood snakes, which was in a ravine near a mountain stream in the neighbourhood of San José; it was not more than a yard off when I first caught sight of it, but looking upon me with evident suspicion, it cleared instantly, a course of action which, all things considered, was scarcely to be regretted.

What struck me most about the collecting in Costa Rica is the immense variety of species, comparatively few of which were ever represented by any very great number of specimens. By far the commonest butterfly in every district we visited was *Anartia fatima*; it was common in the swampy lowlands, and common, too, in the wet grassy lanes round San José (3400 feet), in fact, common everywhere. Some of the *Callidryas* were also abundant in certain places, where they would sit in clusters on a patch of wet mud, and get up when disturbed in such bewildering multitudes that, in one's anxiety to net the rarer species amongst them, and only those in prime condition, it often resulted in very few being netted at all; for they are shy butterflies, and when once disturbed, they do not very readily re-assemble at the same spot. The *Heliconidæ* were well represented everywhere, but no one species could ever be said to swarm, and several of them were decidedly rare. We did better in the neighbourhood of San José than anywhere else, especially in July, but this was, I think, largely owing to the fact that the facilities of penetrating into the surrounding country were certainly greater than at Limon or Guapiles, though this last-named place was wonderfully fascinating in the abundance and beauty of the species occurring there, and wonderfully fearsome as regards the accommodation to be obtained in its one and only inn!

It was a never-ceasing mortification to me that there were no tracks leading through those prolific forest swamps of the lowlands, or even if there was a small path, it soon came to an end, and, moreover, more often than not was rendered useless and

impassable by the constant and heavy rainfall; for who can catch butterflies, be they ever so abundant, standing over one's ankles in mud, whose peculiarly sticky qualities would suggest to the most unimaginative mind that an extract of glue could surely be obtained from the mud of Costa Rica! In fact, it was not at all an unusual event to find oneself "stuck fast" in this black gluey mixture, and to see some beautiful unknown species of butterfly come and settle within easy reach of the net, only a few yards away from where the mud-bound biped would be standing exasperate but quite helpless and powerless to effect its capture, till the bright vision would vanish as it had come, all unconscious of the possible danger that had menaced it from below.

I could not make out that in the lowlands of Costa Rica, at least on the Atlantic side, there is ever a dry season; it rains all the time with, of course on some days, intervals, often of several hours, of fierce sunshine, and then it is that one sees the butterflies! At San José, and in the higher mountains, there is a dry season, from December onwards during the winter months, which, however, the inhabitants call the "summer," and the wet season is the "winter" for them, though, of course, as Costa Rica lies north of the equator, this is not really the case. On the Pacific side the climate is, I believe, much drier, but of that I can say nothing from personal experience; except for one day's collecting at Rio Grande, which only tended to give me some idea of what that side of Costa Rica would have been like had various circumstances not prevented me from even trying to work it. I was told, on more than one good authority, that, except for *Morphos* and *Caligos*, the Pacific side has certainly far better collecting even than the Atlantic side, and from that one day at Rio Grande alone, I can readily believe it.

The following is a list of the species taken during the five months, from March 23rd to August 14th, 1911, that we collected in Costa Rica—one hundred and fifty-seven in all:—

*Papilio americus*, Koll.—This butterfly (which seems to come closer to *P. hospiton* than any other *Papilio* I know) was common all round San José in June and July.

*P. thoas*, Linn.—Fairly common at Santo Domingo, near San José, in July. I secured two very fine females.

*P. photinus*, Doubld.—This *Papilio* was very common at Rio Grande on July 27th, but unfortunately the condition of the specimens left much to be desired, in fact, I only took one female I considered worth setting.

*P. polydamus*, Linn.—Observed at Limon; not very common. I did not succeed in taking a good specimen, and having already a fine series of bred ones from Jamaica, perhaps I did not trouble very much about it.

*P. numitor*, Cram.—A large *Papilio* larva, bearing a strong resemblance to the larva of *Polydamus*, found by me at San Antonio,



11 kils. from San José, produced a female of this species; this being the only specimen I have, for, though we occasionally saw what we believed to be the same butterfly flying over the flowers of tall forest trees, we never succeeded in netting one.

*P. pandion*, Feld.—This butterfly, which must be very closely allied to *P. anchisiades*, Esp., occurred at San José in July. It was not common, and I only seem to have got one specimen.

*P. branchus*, Doubld.—One female taken at Limon in August is all I have of this species.

*P. mylotus*, Gray.—The commonest of all the *Papilios* in the lowlands, especially at Guapiles in April and May. I took a good many specimens there, and a few at Limon.

*Daptonoura isandra*, Boisd.—Only seen at Limon in August, flying in some numbers round a flowering shrub, but very restless and difficult to catch, besides which all those that were netted were in poor condition.

*Tachyris ilaire*, Godt.—Occurred at San José in June and July, but was not abundant.

*Pieris josepha*, Godm. & Salv.—Only occasionally seen at San José; but was very common at Rio Grande on July 27th.

*P. elodia*, Boisd.—Common at Cartago and all round San José throughout the summer. I found a batch of *Pieris* ova one morning when we were gathering water-cresses for luncheon in an elevated meadow near Cartago, from which I eventually bred half a dozen specimens of this butterfly. Their fresh supplies of food-plant used to be purchased in the market at San José. The full-grown larva is rather like a green centipede to look at superficially, as it has an oily appearance; in colour it is dull, pale green, ringed regularly with darker green from head to tail.

*P. calydonia*, Boisd.—Common, but quite *passé*, at Rio Grande, July 27th.

*Terias albula*, Cram.—Fairly common at Limon and Guapiles.

*T. delia*, Cram.—Common at San José; also taken at Guapiles.

*T. neda*, Godt.—At Limon, San José, and Guapiles, but not very common.

*T. euterpe*, Ménet.—Only fairly common. I have two males from Cartago in May, also a male and female from San José, the former of which is very grey on the under side of the hind wing.

*T. westwoodii*, Boisd.—Common all round San José, flying along the damp, grassy lanes throughout the summer. A magnificent form. The female was comparatively scarce.

*T. damaris*, Feld.—This lovely *Terias* was very common at San José in June and July, and the females were more easily to be met with than were those of the preceding species.

*T. xanthochlora*, Koll.—Very scarce, only taken rarely in one locality near San José; and I have also one specimen from Guapiles.

*T. mexicana*, Boisd.—Very common at San José, also taken at Cartago in May; the females were not very scarce either.

*T. proterpia*, Fabr.—This exceedingly beautiful butterfly occurred somewhat rarely near San José; but it seemed to be fairly well represented in the great crowd of butterflies at Rio Grande.

*Acmepteron nemesis*, Latr.—Occurred at Cartago and San José, but was very scarce at both places.

*Dismorphia albania*, Bates.—One specimen only taken at San José in July; I did not see any others.

*D. praxinoë*, Doubld. — One specimen only from Guapiles in May.

*Megonostoma casonia*, Stoll.—First seen at Cartago in May. At San José it flew fairly abundantly in the neighbourhood of the Pacific Railway Station, where there were some fields of a certain kind of vetch, on which I saw the females depositing their eggs; it occurred wherever this vetch was growing. At Rio Grande, like many other things, it fairly swarmed.

*Callidryas fabia*, Fab.—The males of this butterfly were very common at Guapiles, less so at Limon. I never saw it up country.

*C. statira*, Cram.—Common at Guapiles, also at San José, less so at Limon. The females were less scarce than those of the preceding species.

*C. trite*, Linn.—Taken at Guapiles and at Limon, but not at all common in either locality. I never saw a female.

*C. eubule* (*sennæ*, Linn.).—Widely distributed. Bred from Limon and at San José. The larva, like all of this genus, feeds on cassias.

*C. agarithe*, Boisd. — This glorious butterfly was common at Guapiles, still more so at San José, flying wildly over the baranco at Santo Domingo, where the never-failing attraction of the *Lantana* flowers sometimes provided a possible chance of capturing this gaudy insect. One male taken in this locality has scarcely any of the brown markings on the under side, and is rather paler above (possibly another species?). *Agarithe* was much less common at Limon, and the females were always scarce everywhere.

*C. philea*, Linn.—Most of my specimens of this butterfly were bred from ova and larvæ found near Limon, where this species was commoner than I ever found it anywhere else. I bred about an equal number of both sexes. The larva feeds on a large kind of *Cassia*, of which I was unable to discover the specific name. It also occurred at Guapiles and San José, at which latter place I again found the larva.

*C. cipris*, Fabr.—I first made the acquaintance of this magnificent butterfly at Cartago in May; here in this earthquake-stricken city it flew in the streets amongst the ruins. At San José in June and July it was quite common, even the females being much less scarce than is usually the case with other species of this genus.

*Gonepteryx clorinde*, Godt.—This exquisite butterfly was very common all round San José from the end of June and throughout July. The females also were not scarce.

*Morpho peleides*, Koll.—This is the only *Morpho* I met with in Costa Rica, though I believe it is by no means the only one that occurs in that prolific country. We first saw it at Limon, where it would fly across the railway track from one forest swamp to the other, affording only a very poor chance of effecting its capture. At Guapiles it was more frequent and easier to catch, as it would fly up and down along a broad stream, a flash of blue light against the dark

foliage of the trees, a sight of loveliness not easily to be forgotten. I stalked what I believed was a female one day for about ten minutes through thick but not swampy undergrowth; she would settle repeatedly and low down, but always arranged to move on to another perch just before getting within reach of my net, till finally I lost sight of her, and then realized that I had been risking snakes, tarantula spiders, and other horrors all for nothing! Not to mention that I found myself covered with ticks from head to foot, so much so, in fact, that a rapid retreat homewards was the only course to be pursued.

*Opsiphanes crameri*, Feld.—Common and widely distributed. I bred it in some numbers at San José; the larva occurring commonly on a certain ornamental palm which grew in all the public parks and gardens. The females even laid their eggs on the plants of this palm growing in pots on the balconies of the houses, where the larvæ when found would be ruthlessly picked off and slaughtered by the Spanish señoritas, who looked upon them as nothing but a pest and a nuisance, to be got rid of as quickly as possible. The very young larva when it first hatches from the egg is extremely like a young *Charaxes*, but it soon becomes much more slender and elongate than are the robust larvæ of that genus; also it has a long forked tail.

*Danaïs archippus*, Fabr.—Not very common, flew on the Savannah at San José.

*D. berenice*, Cram.—Widely distributed and often common.

*Lycorea ceres*, Cram.—Not uncommon near San José in July; mostly taken on the *Lantana* flowers in the famous butterfly-haunted baranco near Santo Domingo.

*Tithorea pinthias*, Godm. & Salv.—One specimen caught at Guapiles, where others were seen. I also obtained some ova by watching a wild female depositing her eggs on a large thick-leaved creeper overhanging a small stream. Four of the larvæ grew and did well, but I was only able to get one of them into pupa before the leaves of the thick-leaved creeper that I had brought with me from Guapiles gave out; and all my efforts were unavailing to find that same creeper at the elevation of San José (over 3000 feet), so the remaining three had to be turned out when just full-fed to search out a food-plant for themselves or die of starvation. The larva is ringed with black throughout on a yellow ground at the two extremities, and bluish white in the centre, two long flexible horns protrude from the first segment behind the head, as in the larva of *Tithorea megara*, which occurs so commonly in Trinidad. The pupa was a suspended blob of glistening, polished gold, but retained nothing of its resplendent beauty when the butterfly had emerged,

*Melinæa imitata*, Bates.—One specimen only, caught at Guapiles.

*Mechanitis scylax*, Salv.—Also only one specimen from Guapiles.

*M. labotas*, Dist.—One specimen from San José.

*M. doryssus*, Bates.—Was taken at Limon, Guapiles, and San José.

*M. isthmia*, Bates (*callifornica*).—I bred a good series of this butterfly from a batch of ova found at Limon. The larva was identical with that of *M. polymnia*, of which I also bred several later



on in Trinidad. The pupa was bright shining gold. This butterfly occurred also at Guapiles, and (more rarely) at San José.

*Thyridia melantho*, Bates.—One female only taken at Guapiles.

*Dircenna klugii*, Hübn.—Common at Cartago in May, and at San José in June and July.

*D. relatu*, Butl. & Druce.—One specimen only, from San José.

(To be continued.)

## NOTES AND OBSERVATIONS.

THE THOMAS BOYD TYPES OF MICRO-LEPIDOPTERA.—It is satisfactory to put on record that these types, as detailed on p. 23 in the January number of this Magazine, are now placed in the National Collection at South Kensington Museum, having been generously presented by Mrs. W. C. Boyd, of The Grange, Waltham Cross.—WILLOUGHBY GARDNER; Deganwy, North Wales, May 19th, 1913.

THE SPRAYING OF OAK TREES IN RICHMOND PARK.—Some interesting experiments have just been carried out in Richmond Park, the object being the extermination of various leaf-eating caterpillars which have attacked the oak trees. The ravages of these caterpillars have been very serious, so that the trees have of late made but little progress owing to defoliation, and in numerous instances the trees have lost their tops. The experiments in question were carried out under the direction of Mr. H. Maxwell Lefroy, Professor of Entomology at the Imperial College of Science, who advised the trees being treated with a spray solution. The group of trees operated upon was the Ham Cross plantation, which comprises about four hundred oaks, and the spraying mixture was a solution of lead chromate, which was applied by means of a petrol-driven pump of the Merryweather "Ravensbourne" pattern, supplying solution to six spraying nozzles simultaneously. The spraying of the trees in the plantation mentioned occupied two days, and if successful the same treatment will be carried out to the other plantations in the Park. By means of the special apparatus employed, the lead chromate was well and evenly distributed, and it remained on the trees.

SOME LEPIDOPTERA NEW TO SUFFOLK. — During the past two seasons I have paid more attention to Hymenoptera and Diptera than to Lepidoptera, but as I have taken a few species of the latter order which are not, I believe, as yet on the Suffolk list, I think I should record them:—*Brachytenia hartmanniana*; three captured on the trunks of old willows near Bury St. Edmunds. *Laspeyresia servillana*; a specimen at Ampton. *Polychrosis abscisana*; not uncommon at Ampton. *Penthina capreana*; several at Tuddenham. *P. nigricostana*; two at Ampton. *Apodia bifractella*; one at West Stow. *Coleophora nutantella*; one at Tuddenham. I have to thank Mr. J. Hartley Durrant for determining most of the above insects for me.—(Lt.-Col.) C. G. NURSE; Timworth Hall, Bury St. Edmunds, April 28th, 1913.



COENONYMPHA TIPHON AND C. PAMPHILUS ON SAME GROUND.—I only know *C. tiphon* in one locality—near Achnasheen, in Ross-shire, where it is very plentiful. There it is found on the same ground as *C. pamphilus*, and I have netted large *pamphilus* in mistake for *tiphon*. I have noticed there that *tiphon* only flies in bright sunshine; directly a cloud partially obscured the sun this butterfly settled amongst the grass-stems close to the ground, though *pamphilus* would still continue on the wing.—J. HAMILTON LEIGH; Culloden House, Inverness-shire.

TORTRIX PRONUBANA.—A little incident has happened to me which may be worth recording. Early in April I discovered a *Tortrix* larva feeding in a geranium leaf in the greenhouse. I took care of it, and to-day (May 16th) the imago has appeared as *T. pronubana*, and a remarkable specimen of var. *ambustana* at that. I cannot account for it being where it was, as I have never found a trace of the species here. Anyway, it seems a new food-plant.—(Rev.) W. CLAXTON; Navestock, Romford.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, March 19th, 1913.*—Rev. F. D. Morice, M.A., Vice-President, and afterwards Mr. J. H. Durrant, Vice-President, in the chair.—Messrs. Thomas Alfred Coward, F.Z.S., Brentwood, Bowdon, Cheshire; William H. Edwards, Natural History Department, Birmingham Museum; Lewis Gough, Ph.D., Entomologist to the Government of Egypt, Department of Agriculture, Cairo; John Hewitt, B.A., Director of the Albany Museum, Grahamstown, South Africa; Carlos E. Porter, C.M.Z.S., Professor of Zoology, Agricultural Institute, Santiago, Chile; and Gilbert Storey, Entomological Research Commission, Natural History Museum, South Kensington, S.W., were elected Fellows of the Society.—Mr. C. B. Williams exhibited two larvae of *Coniopteryx tineiformis*, eight of which were beaten from pines at Oxshott, on the 16th inst.—Mr. Donisthorpe, various species of ants of the genus *Eciton*, the “Wander Ants,” and gave some account of their interesting habits.—Mr. W. C. Crawley, a few ants collected during September, 1909, in Pennsylvania and Cleveland, Ohio, including *Polyergus lucidus* and *Formica rubicunda*, two of the slave-makers, with their slaves; and some species collected with Dr. Forel in Switzerland, August, 1912. Among the latter were *Camponotus lateralis* and *C. ethiops*, two species of special interest, as they belong to the xerothermic fauna, relics of a post-glacial period.—The Rev. F. D. Morice made the following exhibits by means of the epidiroscope:—1. Lantern-slides showing the pectinated antennæ of the male in the sawflies *Lophyrus pini*, L., and *Monoctenus juniperi*, L., the latter new to Britain and not yet recorded. It was taken pretty freely on juniper, at Nethy Bridge, in June, 1907, by Messrs H. Scott and C. G. Lamb. 2. Lantern-slides showing paradoxical (secondary sexual) characters in the legs of numerous male Aculeates (bees, wasps, and fossors). 3. Microphotos of the apex of the female “terebra” in *Cimex lutea*, L., and *C. femorata*, L. (magnified ninety

diameters). 4. Entomological Congress groups at Oxford and Tring. (Lantern-slides.) During the course of this exhibit, Dr. Chapman, at Mr. Morice's request, explained the manner in which he had seen the wings of the female *Odynerus spinipes* imprisoned between the tridentate middle femora and excavated middle tibiae of the male.—A paper by Mr. H. Eltringham, M.A., F.L.S., "On the Scent-apparatus of *Amauris niavius*, L.," was read by the author, the black-and-white drawings by which it was illustrated being thrown on the screen.

Wednesday, April 2nd, 1913.—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Messrs. André Avinoff, Liteyny, 12, St. Petersburg; W. Bowater, Russell Road, Moseley, Birmingham; J. S. Carter, Warren Hill Cottage, Eastbourne; James Davidson, M.Sc., Imperial College of Science and Technology, South Kensington, S.W.; Arthur H. Foster, M.R.C.S., L.R.C.P. (Eng.), M.B.O.U., Sussex House, Hitchin; J. A. de Gaye, King's College, Lagos, South Nigeria; Oliver Hawkshaw, 3, Hill Street, Mayfair, W., and Millard, Liphook; and Ernest Edward Platt, 403, Essenwood Road, Durban, Natal, were elected Fellows of the Society.—The Rev. G. Wheeler explained that he had been mistaken in some of his observations on *Argynnis auresiana*, which he exhibited on October 16th. The name *auresiana* was given by Fruhstorfer, not by Oberthür, and a few specimens were already known before Mr. Powell discovered it in numbers at Lambessa, as previously stated. It had also been figured by Turati.—Mr. E. Ernest Green exhibited cards showing the transferred wing-scales of butterflies.—Mr. Donisthorpe, a specimen of *Tetramorium cespitum*, L., worker, from a colony found by Mr. Evans on the Bass Rock in Scotland, March 21st, 1913; the most northern records known in Britain were Denbigh in Wales, and Cambridgeshire and Suffolk in England.—Mr. W. C. Crawley, numerous species, subspecies, &c., of ants from Egypt, which were taken at Helouan during December and January last.—Dr. Jordan gave a short account of the Zoological Congress at Monaco, with special reference to entomological nomenclature, and thanks were voted to the Society's delegates for their work at the Congress, and to Dr. Jordan in particular, for his interesting and satisfactory account of it.—The following papers were read:—"On the Classification of British Crabronidae (Hymenoptera)," by R. C. L. Perkins, D.Sc., M.A., F.L.S. "Descriptions of New Species of the Syrphid Genus *Callicera* (Diptera)," by the late G. H. Verrall, F.E.S. Edited by J. E. Collin, F.E.S. "Neue Pyrgotinen aus dem British Museum in London," von Friedrich Hendel, Wien. — GEORGE WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—April 10th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Buckstone exhibited living larvæ of *Scodionia fagaria* (*belgiaria*) from Oxshott.—Mr. Newman, a remarkable aberration of a hybrid between *Ephyra annulata*, male, and *E. pendularia*, female, in which the outer half of all the wings was melanic.—Mr. A. E. Gibbs read a paper entitled "Through the Balkans with a Camera," illustrating his remarks with a number of lantern-slides of views and

scenes in Bosnia and Herzegovina, where he made a collecting tour in 1912.

*April 24th.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—The evening was devoted to a special exhibition of specimens of orders other than Lepidoptera, and was a most successful meeting.—Mr. R. Adkin exhibited an original copy of 'A Naturalist's Calendar' (1795), being extracts from Gilbert White's diaries, and a facsimile reprint of Gilbert White's 'Flora Selborniensis' by the Selborne Society in 1911. Also he exhibited a spider's web and spider mounted between glass by the late Mr. H. McArthur.—Mr. W. West (Greenwich) placed on the tables sixteen drawers of the Society's reference collections (British), *viz.* two of Orthoptera, presented by Dr. Malcolm Burr, &c., two of Neuroptera, presented by Mr. W. J. Lucas, Mr. W. J. Ashdown, &c., one of Hymenoptera, and eleven of Coleoptera.—Mr. West also exhibited twelve drawers of his own collection of British Heteroptera, Homoptera, and Psyllina.—Mr. E. A. Newbery, a number of new and rare species of British Coleoptera, including *Apion selousi*, *Trachypheus digitalis*, *Lathrobium ripicola*, *Homalota aquatilis*, *Myrmecopora brevipes*, *Thinobius pallidus*, *Cartodere argus*, *Dermestes peruvianus*, *Bledius denticollis*, *B. filipes*, *B. sacerdensis*, *Ceuthorhynchus parvulus*, *Laccobius purpurascens*, *Orthochaetes insignis*, &c.—Mr. Priske, varied forms of the coleopteron *Geotrupes mutator*, from Hanwell.—Mr. Ashdown, examples of the species of Hemiptera and Hymenoptera taken in Switzerland, including *Cicadetta montana*, *Elia acuminata*, *Harpactor iracundus*, *Mutilla europæa*, &c.—Mr. Sheldon, two species of "firefly" met with on the Continent.—Mr. Hy. J. Turner, Homoptera from S. America resembling Lepidoptera in form and marking, including the beautiful *Pæciloptera phalaenoides*; Heteroptera of bizarre form and marking from Colombia, &c., including *Apiomerus hirtipes* with two curious processes ("flags") at the anal extremity of the abdomen; two large-bodied Orthoptera from the Transvaal used as food by the natives; and a box of large and conspicuous insects from the up-country of Western Australia—Aculeata, Diptera, Ichneumonidae, Odonata, &c.—Mr. K. G. Blair, living scorpions, earwigs, and glow-worms from Monaco, and gave his experiences in the States of the "flashing" of the fireflies, and an account of the experiments there carried out with artificial "flashing."—Mr. Buckstone, insects of various orders from New South Wales.—Mr. Main, two species of cockroach and a large glowworm, &c.—Mr. Ashby, Hemiptera and Coleoptera from Oyo, Southern Nigeria, and his collection of *Donacia*, *Chrysomela*, and *Cryptocephalus* (Coleoptera).—Mr. Gibbs, a case containing specimens of *Sirex noctilio* and *S. gigas*, the sawflies whose larvæ cause much damage to fir timber, and examples of the damage caused. He also showed a case of the various groups of the suborder Hemiptera, and gave notes on the two exhibits.—Mr. H. Moore, two drawers of Orthoptera, one mainly European, the other large exotic leaf crickets; a box of Xylocopidae, violet carpenter-bees from all over the world; a case of lantern-flies, Fulgoridae; foreign insects introduced to Deptford by shipping, such as *Blabera cubensis*, *Acheta bimaculata*, *Acridium ægyptium*, &c.; and a selection of Orthoptera and Homoptera to illustrate a note on "Singing



Insects."—Mr. Andrews, specimens of "Witches' Broom" fungus-gall *Ascomyces* sp.? on willow, and types of sixty-three species of Diptera taken in the months of March and April, chiefly at willow-blossom.—Mr. Coxhead, specimens of plant-galls and some very beautiful water-colour drawings of the same, and the gall-fly *Uromyces ficariae* under the microscope.—Mr. West (Ashtead), four species of *Collembola* under the microscope.—Mr. Edwards, large and conspicuous species of Phasmidæ, Mantidæ, Gryllidæ, and Hymenoptera chiefly from British North Borneo, together with the remarkable chelifer, *Thelyphorus lucanoides*, and the curious Arachnids, *Actinacantha arcuata* and *Gasteracantha vittata*.—HY. J. TURNER (*Hon. Rep. Sec.*).

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—April 2nd, 1913.—Meeting held in the Manchester Museum. — The Secretary read on behalf of the Rev. S. Proudfoot, F.E.S., a paper entitled "The Delights of Entomology." — Mr. B. H. Crabtree, F.E.S., exhibited a long and remarkably varied series of *Noctua primulae* (*festiva*) var. *conflua* bred from the Shetlands.—Mr. J. H. Watson showed some interesting Javan lepidoptera from the Leyden Museum. These were *Cricula andrei* var. *claezia* female, hitherto undescribed; a very curious aberration of *C. andrei*, without any fenestræ; *Antherea* nov. sp. (?), closely allied to *A. helferi* from Assam. He also showed *C. andrei* and *trifenestrata* from Assam, and *C. trifenestrata* from Burma.—Mr. R. Tait, junr., showed his series of the genera *Pachnobia* and *Teniocampa*, which included a fine lot of *P. leucographa*.—Mr. J. E. Cope exhibited coleoptera from Robertson, Cape Colony, including two large species of *Psammodes*, a large *Adephagus* beetle, and a small chafer similar to our own *Rhizotrogus*.—A. W. BOYD, M.A., *Hon. Sec.*

## OBITUARY.

By the death of MR. HERBERT DRUCE, the Entomological Society of London loses one of its oldest and most prolific workers in the wide field of universal Lepidoptera. Born on July 14th, 1846, from his earliest boyhood he developed deep interest in entomology, and his election to the Society took place when he was just one and twenty. From that time onward he soon made a name as a diligent collector and describer, among the more important of his contributions to contemporary scientific literature, and to our knowledge of the world's species, being the three volumes (with plates) dealing with Heterocera in the 'Biologia Centrali Americana,' upon which he concentrated his energies over a considerable number of years. In addition to this, he published several monographs of genera, and described a large number of species new to science in the 'Transactions' of the Entomological Society of London, the 'Proceedings' of the Zoological Society, the 'Entomologist's Monthly Magazine,' and the 'Annals and Magazine of Natural History.' Serving on the Council of the Entomological Society in 1885 and 1892, he was also a Fellow of the Linnean, the Zoological, and the Royal Geographical Societies. We hear that his magnificent collections are shortly to be sold.



## RECENT LITERATURE.

*The Theory of Evolution in the Light of Facts.* By KARL FRANK, S.J. With a Chapter on Ant Guests and Termite Guests. By ERICH WASMANN, S.J. Translated from the German by CHARLES T. DRUERY, F.L.S. London: Kegan Paul. 5s. net.

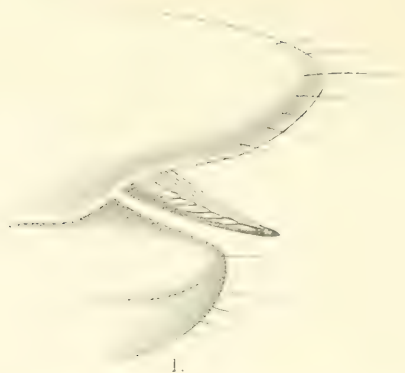
IT is not easy to conjecture with what object this little book on Evolution has been written. Some parts of it might serve as a useful introduction for anyone who was about to read Darwin's 'Origin of Species' for the first time. The author is almost as keen an advocate as Darwin himself of the theory of modification of species by adaptation and descent, and although he puts down to "a purposeful striving" of the individual certain of those variations or adaptations which Darwin could only explain by the use of the word "chance," he seems to admit that the species which are not purposefully adapted to their environment are doomed to extinction. Father Frank, however, is by no means a whole-hearted Darwinian; nor is he always quite fair to Darwin, for, while objecting strongly to the expression "chance variation," he forgets to mention that Darwin, who had no theological view to maintain, pleaded ignorance of the cause of variation as his excuse for making use of what he called "that wholly incorrect expression." The arguments brought forward in this book in an attempt to show the limitations of Evolution, and that no one class of plants or animals has been derived from another, are based chiefly upon the imperfection of the palæontological record, and are anything but convincing. Entomologists who are left free to believe that the whole of our existing insects, in all their diversity of form and structure, are but the modified descendants of a single pre-existing order, the ancient Palæodictyoptera, will hardly be restrained from going a step further to seek the ancestor of the insect in some other form of animal life. They are puzzled even now to know to what class they can assign those interesting little creatures, the Protura, which exist, it appears, in abundance, and yet have only been discovered within the last half-dozen years. If these have remained unknown so long, what is there strange in the fact that so few transitional forms have been discovered as fossils in the rocks?

Father Frank claims to have "dealt fully" with the "chief postulate" of the theory of Evolution—the origin and development of the animals from the plants. But his claim is scarcely justified. It is one thing to discuss the difference between the "psyche" of an oak tree and of a donkey, and another to discover the soul of an amœba, and to show wherein it differs from that of a lowly organized plant; and Father Frank has not attempted the latter task.

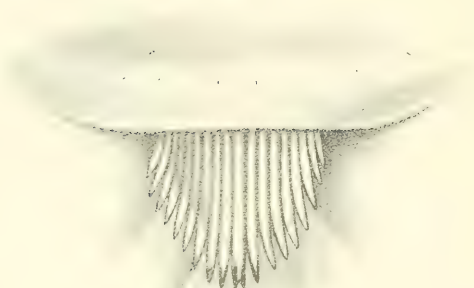
The chapter which Father Wasmann has contributed is very interesting, and the student of Coleoptera will find something of interest also in the table, taken from Handlirsch, which illustrates the pedigree of the beetles and their distribution in time. Faults in the translation give rise to contradictory statements in the book, and especially noticeable is the use of the word "family" in several cases where "phylum" or "group" should appear instead.

C. J. G.





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## FÆCES EJECTOR OF LEPIDOPTEROUS LARVÆ.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

(PLATE X.)

CERTAIN lepidopterous larvæ are provided with a remarkable comb-like apparatus for the forcible ejection of their excreta, which probably is most highly developed in the Hesperidæ.

This organ has been referred to by Dr. O. Hofmann in his description of *Secaphila minusculana*, published in the 'Entomologist's Annual,' 1873, p. 62; stating:—"Immediately behind and under the anal plate, exactly above the anal opening, is a small semicircular plate of black chitine, about half the size of the anal plate itself, which is extended posteriorly in six long black thorns, and probably has for its object to assist in the evacuation of the excrement. This formation is entirely wanting in the closely allied *S. wahlbomiana*, but, on the other hand, it occurs again in the closely allied *communana* and *virgaurana*." Also, in 'Novitates Zoologicæ,' vol. xvi. p. 331, Dr. K. Jordan describes and figures the anal comb or fork which he and the Hon. Walter Rothschild found in the larva of *Somabrachys*. In all the specimens examined each had either three or four tines; these, he states, were "always practically of equal length. They vary in shape, inasmuch as some are pointed and others truncate and dentate. . . ." Dr. Jordan also adds: "We ascertained its use by observing the live larva under a lens. When the fæces leave the anus the rake is employed to push them outside, and give them a final jerk, which sends them rolling off the anal segment."

In the life-history of *Carterocephalus palaemon*, which I published in the 'Entomologist,' 1892, vol. xxv. p. 256, I noted the fact that the larva of this species "has the power of casting its excrement sideways with considerable force, as if propelled by a spring, sending it a foot or more, which undoubtedly is a means to prevent fouling its domicile." This habit, I have noticed, is common with the Hesperidæ larvæ.



While recently figuring the fully-grown larva of *H. sylvanus*, I carefully watched it under a lens to ascertain the exact way in which the pellets of excreta are ejected. \* This enabled me to make a momentary sketch of the performance, reproduced in the accompanying Plate, fig. 3. Just previous to the act the larva crawls backwards along its tubular dwelling (composed of either two or more blades of grass spun together in the form of a cylinder) until its extremity is either at or slightly protruded beyond the tube; it then raises its anal segments, elevating the plate or flap, and evacuates the fæces, which remain adhering to the anus. The comb is then brought down to the rim of the anal orifice, and remains so fixed for a moment or two, as if to obtain a firm pressure with the tips of the tines or teeth; then, apparently with considerable power, it is suddenly released, spring-like, the comb flies up with a violent jerk, casting the pellet with remarkable force in an upward direction. In order to learn the distance the larva can cast the excrements, I placed three examples in a vertical position on a white cloth, and found the distance they fell (without rolling) between 2 ft. 6 in. and 3 ft., the furthest being exactly 3 ft.

It will be seen by fig. 2 (posterior view) the comb consists of eighteen asymmetrical teeth, solidified over the greater portion, then separated and turned slightly outwards at the tips; they gradually decrease in length from the long central ones, the whole forming a semi-ovate structure. The middle tooth or tine is dentated, the others being simple pointed. The colour is pale ochreous yellow, the four longest having black tips. Fig. 1 shows the anal flap and comb slightly raised (lateral view).

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## NOTES ON BUTTERFLIES OF HONG KONG AND JAPAN.

BY MAJOR B. TULLOCH, F.E.S.

THE most curious butterfly I have taken at Hong Kong is *Pieris rapæ*. Not, of course, that the insect itself is curious, but the fact of this species being captured so far south, right in the Tropics, is curious. I have never heard of it having been seen or taken before in Hong Kong. The insect was quite perfect, evidently just emerged from the chrysalis. It approaches in appearance a small specimen of *P. rapæ* var. *crucivora*, with a well-marked yellow basal streak on the under side of the hind wing. I captured it quite accidentally, under the impression that it was a small specimen of *Huphina nerissa*, dry forms of which I was trying to catch. The capture was made on December 12th, 1912. The other butterflies on the wing at the spot in which I took it were *P. helenus*, *Leptocircus curius* var.

*walkeri*, *Hebomoia glaucippe*, and *Huphina nerissa*, all tropical species.

The manner in which *H. glaucippe* emerges from the chrysalis is very remarkable, if all butterflies of this species emerge in the same way as the one did which I watched coming out, in a breeding-cage. The pupæ of this species are very bent back in the middle, so that in the pupal stage the legs of the insect are, as it were, in the air, the back of the unformed butterfly being downwards, when the pupæ are attached to a vertical object. Whilst I was looking at the chrysalis in question, the butterfly began to emerge. After all its legs and wings had been withdrawn from the pupal case, it lay still for a few seconds with the body in the pupal case, the legs being free and pointing upwards. But there was nothing above the insect which it could catch hold of in order to enable it to get a purchase and withdraw the body from the case. The way in which the problem was solved was very interesting. After a pause of a few seconds in order to take breath, as it were, the insect suddenly gave a great heave by contracting and expanding its body quickly, and out it came, backwards, falling right over and making a complete back somersault. As it fell it seized the lower extremity of the pupal case with its legs, and there it remained and dried its wings, as if turning heels over head backwards was the easiest possible thing for emerging butterflies. What happens if they miss the empty pupal case is, I suppose, that they catch hold of the nearest leaf or twig and hold on to that.

On page 108, vol. ix. of Seitz's 'Macro-Lepidoptera of the World,' it is stated that the earlier stages of *Leptocircus curius* are unknown. I have bred many of these butterflies, of the variety *walkeri*, so the following account may be of interest:—

The egg is laid singly on the upper side of the climbing plant *Illigera cordata*, which is very local in Hong Kong. The egg is round, and pale shining green. The newly emerged caterpillar is dark olive-brown. Until a quarter grown it remains the same dark greenish brown colour, with a greyish white stripe along the spiracles. The legs are greyish white. As is usual in many "swallowtail" caterpillars the anterior segments of the young larvæ are swollen, so that looking at the caterpillar from above it has the exact shape of a tennis racket, the swollen segments being very flattened out sideways. The young caterpillar eats irregular patches off the thick upper surface of the leaves. It begins to feed at the edge of a leaf when about a quarter grown. When full grown the larvæ are one inch in length, of a dull dark apple-green colour, the skin being rough like shagreen. The head is pale yellowish green, and on the neck are four small circular shining black dots. A whitish line runs along the spiracles, and the legs are greyish white.

The full-grown caterpillar resembles a small caterpillar of *P. eurypylus*. When about to pupate the larvæ become very pale semi-transparent green, exactly in the same way as do the caterpillars of *P. agamemnon* and *P. eurypylus*. The pupæ in a wild state attach themselves to the upper surface of the leaves on which they feed. In the breeding-cage they wander off the leaves and fasten themselves to the glass or woodwork. The colour varies according to their surroundings. Ordinarily, if attached to leaves, the pupæ are dull apple-green, the same colour as the caterpillar. On the thorax is a sharp projecting prominence which points forward, and from the apex of this prominence run five greyish brown fine lines, one down to the front of the head, two along the sides, and two along the back. These last four meet at the tail. In the breeding-cage the pupæ which attach themselves to the glass are very pale green, almost transparent; those which prefer wood on which to pupate assume the colour of the wood. The eggs, caterpillars, and pupæ are exactly the same in colour and shape as those of *P. eurypylus*. As the food-plant is extremely local, so also is the perfect insect, but it is common where it occurs. I have never seen it hovering over water, as is described in Seitz, but it may do so. There is no water where the food-plant grows in Hong Kong. The butterfly has the usual *Papilio* habits, that is to say, it flutters its wings when feeding at flowers, and when resting sits with the wings open, the upper ones half covering the lower ones. The long thin tails are not moved independently from the hind wings, the apparent movement up and down being caused by the vibration of the hind wings themselves. During the hot weather a succession of broods come out, the pupal stage only lasting ten days at the outside. In the cold weather the pupal stage lasts from December to March. I am unable to give further minute details or illustrations, as my duties in South China as a general staff officer kept me too busy during the Chinese Revolution to keep exact records of dates as to the various changes of the larvæ skins, &c.

I notice in 'Butterfly-hunting in Many Lands,' by Dr. Longstaff, the statement on page 539 that *P. sarpedon* does not flutter when feeding. He is quite right to say does not "flutter," as the insect "vibrates" its wings. Does Dr. Longstaff mean that it keeps its wings quiet when feeding? If so, I must differ. *P. agamemnon*, *P. eurypylus*, and *P. sarpedon*, all "vibrate" their wings so rapidly that the insect only rests on flowers on the tips of its toes as it were, when feeding, the rapid movement of the wings keeping the insect almost poised like a "humming-bird" hawk-moth. Indeed, so rapidly does *sarpedon* vibrate its wings that it is difficult to see whether the insect is perfect enough to be worth catching.

There is another point with which I am not in agreement



with Dr. Longstaff. He puts forward the theory that butterflies possibly orient themselves, or lie over sideways, in order to escape detection. From observations I have made on many hundreds of butterflies in South Africa, India, Malta, Mauritius, Japan, and South China, I am convinced that the so-called orientatation, or lying sideways, is only done in order to enable the sun to warm an additional wing area. A large number of butterflies orient themselves roughly towards sundown, and open their wings for the very obvious purpose of getting the warmth from the sun as it gets lower down in the heavens. Even "swallowtails" of various kinds do it, and I have seen *P. rapae* do it in Malta. The most obvious cases of inclining sideways for purposes of warmth were two I noticed in Hong Kong on two separate days in December last. The weather was bright and sunny, but a cold east wind was blowing, cold, that is to say, for the Tropics, and few butterflies were about. On each occasion the butterfly under observation was a *Catopsilia pomona*, one a male, and the other a female. Now *C. pomona*, ordinarily, is a very rapid flyer, and when it settles it does so suddenly, with a snap of the wings as it were, and when it does settle it is generally almost impossible to see, as it closes its wings on its back and remains perfectly upright. However, on each of the two occasions now mentioned the butterflies inclined sideways, so that the wings nearest the sun were at right angles to its beams. As the season was not the usual time when *C. pomona* is out, and the day was unusually chilly, obviously the butterflies had inclined sideways for warmth and not for concealment. The result was, that instead of the butterflies being invisible when at rest, the moment they inclined over to the angle of 45° they became visible on the foliage at a distance of over fifty yards as bright yellow spots. The question of lessened shadows, as mentioned on page 551 of Dr. Longstaff's book, could not possibly arise as a means of protection. A bird would have made a bee-line for the yellow spots representing the butterflies, and the shadows would not have been seen until the bird, or the observer, was almost touching the butterflies.

Last summer, 1912, I managed to get in two months' leave to Japan. Considering the heat of the climate in July and August, and the luxuriance of the vegetation, I was disappointed on the whole with the butterfly fauna. I managed, however, to take some fifty odd species of butterflies which I wanted, and managed to get a good series of each. Among my best captures were *P. bianor* var. *maacki*. These splendid butterflies were of two different types, some having metallic green markings others metallic blue markings. The blue varieties are very fine to look at. The most local insect was *Lethe callipteris*, which I only found in the woods round Lake Chuzenji, above Nikko, some 4000 ft. up. Here it was quite common. In



Seitz's 'Macro-Lepidoptera,' vol. i., page 86, there is a statement that possibly *L. callipteris* is only a local race of *L. labyrinthica*. Now *L. callipteris* is a very feeble flier. In fact, when flying it does not look like a *lethe* at all, as butterflies of this genus, at least those I have come across, *L. europa*, *L. confusa*, *L. sicelis*, and *L. diana*, are all rapid fliers, darting up and down and pitching suddenly on leaves, whereas *L. callipteris* flaps about slowly and deliberately. If, therefore, anybody can say whether *L. labyrinthica* is a butterfly of rapid flight, or a feeble flier like *L. callipteris*, the matter would be nearer settlement as to whether they are one and the same species, but local races, or not.

On the road up to Umoto from Chuzenji *Apatura ilia* var. *substituta* was common. It is easy to catch, as it likes settling on the roadway. The marsh near Umoto is a grand collecting ground. *Neptis lucilla*, *Argynnis daphne*, and *A. adippe* var. *xanthodippe* (?), occurred in crowds amongst other things, the day I spent there.

On page 10 of Seitz's work there is a statement that the caterpillar of *P. demetrius* is similar to that of *P. xuthus*, and also that the caterpillar of *P. bianor* is on the whole similar to that of *P. demetrius*. As I have bred the three above-mentioned butterflies from the larvæ, and also *P. polytes* and *P. helenus*, I must beg to differ from Seitz's statement. The caterpillars of *P. polytes*, *P. helenus*, and *P. demetrius* are almost identical in marking, colour, and size. The larvæ of *P. bianor*, at all events in Hong Kong, are quite different in appearance from the three preceding ones, and the larvæ of *P. xuthus* is, again, quite different in appearance from any of the others.

Whilst at Miyanoshita, Japan, I collected a number of larvæ which puzzled me somewhat, as I thought they belonged to *P. polytes*, of which I have bred scores. But I knew that *polytes* did not occur in that locality. Then I thought they might belong to *P. helenus* var. *nicconicolens*, but Seitz was doubtful of its occurrence in the central island of Japan. However, the puzzle was solved by the resultant butterflies turning out to be *P. demetrius*. There is no apparent difference between the larvæ of *P. polytes* and *P. demetrius*, but those of *P. helenus* are somewhat larger, and the green is brighter. Otherwise all three look the same.

On page 11 of Seitz's 'Macro-Lepidoptera,' vol. i., there is a statement that the occurrence of *P. nicconicolens* on the central island, at Nikko, requires confirmation. I saw the insect myself at Kyoto and Miyanoshita, in the central island, in August, 1912. As Miyanoshita and Nikko are both in the same island, and of the same altitude, viz., about 2000 ft., there appears to be no reason why it should not occur at Nikko.

In vol. ix. of Seitz's work, page 163, one reason for

separating *Catopsilia pomona* from *C. crocale* that is adduced is that *C. pomona* has red antennæ and *C. crocale* black ones. Judging from the behaviour of *C. pyranthe* in Hong Kong, however, this is no distinguishing mark. Looking at a series of twelve I bred here in June, 1912, I find that six are wet season (form *chryseis*) with grey antennæ, five are dry season with pink antennæ, and the twelfth, a sporting individual determined to take no chances, has one grey antenna and one pink one; otherwise being of the dry form!

There are one or two points in connection with the mimicry theory which puzzle me in Hong Kong.

*P. polytes* has two forms of the female here, one of which is like the male and the other is a "mimic" of *P. aristolochiæ*. The mimicking form is almost as common as the ordinary form of the female (*polytes*), yet I have never seen a specimen of *P. aristolochiæ*, either on Hong Kong island itself or in the New Territory, though it has been known to occur in Hong Kong.

Again, *Argynnis niphe*, which is very common in Hong Kong and on the mainland, has a female which might be said to "mimic" *D. chrysippus* or *D. genutia*, both of which are also common, especially the latter, which the female *niphe* most resembles. But *A. niphe* does not, as a rule, occur at either the same place or time as *chrysippus* or *genutia*.

*Niphe* loves the open grassy hilltops, and *genutia* the woods and edges of woods, keeping off hilltops altogether; and *chrysippus*, although not liking such woody spots as *genutia*, does not occur on the breezy uplands with *niphe*. Moreover, *niphe* occurs chiefly during the wet season, i.e., spring and summer, and is hardly ever seen in the autumn here. *Genutia*, on the other hand, is most plentiful in the late autumn, and *Chrysippus*, when it occurs in the summer, does so in places where *niphe* is practically never seen. *Chrysippus* also occurs in the autumn, but is not so common as *genutia*. It seems, therefore, to be waste of energy on the part of the female *niphe* in Hong Kong to copy the colour-scheme of insects which she very rarely comes across. Why is it done at all? She ought to have reverted locally to the colour-scheme of the male.

Hong Kong, 1913.

## THE FIRST FOSSIL MYDAID FLY.

By T. D. A. COCKERELL.

HANDLIRSCH, in his great work 'Die Fossilen Insekten,' quotes Scudder as reporting "several" Mydaidæ (Midasidæ) from the Florissant shales. On looking up Scudder's exact words, we find that he merely said he had "several species of Midasidæ or Hermoneuridæ." Since the latter family is represented by

several described species from Florissant, Scudder's statement cannot be taken as positive evidence that he had any Mydaidæ at all, and up to the present time there has been nothing definite on the palæontology of the family. It is therefore with considerable pleasure that I recognize a veritable Mydaid among some materials gathered by one of the University of Colorado expeditions.

*Mydas miocenicus*, n. sp.

Represented by a wing lacking the apex, which was probably about 12 mm. long, the breadth (depth) being a little over 4 mm.; hyaline, with a broad dusky suffusion along the veins, as in some of the living forms; there is especially a fuscous cloud at the end of the discal cell. I cannot see anything in the venation which does not accord excellently with the modern genus *Mydas*. Compared with the wing of *M. vittatus*, as figured by Verrill ('British Flies,' v. p. 607), the following differences are apparent:—

- (1) Alula is broader and less produced.
- (2) End of anal cell is more distant (about 560 microns) from margin of wing.
- (3) Apex of fourth posterior cell more produced and acute, its lower apical side (from divergence of upper branch of fifth longitudinal vein to apex) 1010 microns long.
- (4) Discal cell on the combined second and third posteriors broader, the breadth 290 microns.
- (5) End of first basal cell rather broader, the breadth about 320 microns.
- (6) Stump of vein projecting into submarginal cell from base of second submarginal longer, about 560 microns.

The costa carries many short black bristles.

*M. miocenicus* was found at Station 14, in the Miocene shales of Florissant, Colorado, by Mr. Geo. N. Rohwer.

According to Williston, the known living Mydaidæ include about a hundred species, especially found in Australia, Africa, and South and Central America. *Mydas* occurs in New Mexico and Arizona.

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## NOTES ON THE OVA OF *LEUCANIA UNIPUNCTA* (*EXTRANEA*).

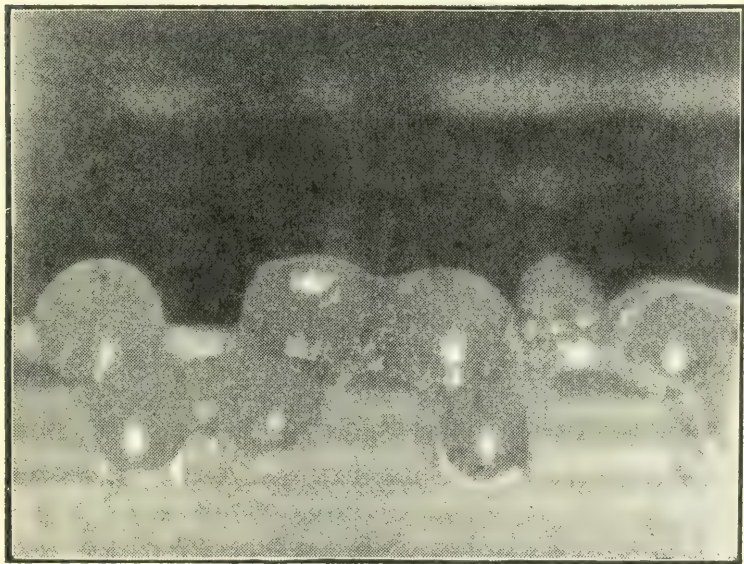
By R. GEOFFREY TODD, F.E.S.

I WAS last year on the South Devonshire coast, and had the good fortune to take two specimens of *Leucania unipuncta* (*extranea*). A few notes on the ova of this uncommon migrant may be of interest.

The first specimen was taken at sugar on August 28th. It was a female, and in hope of ova was placed in a tin containing grass-heads and dead reed-stems, and fed with sugar and water. It was very sluggish, and as it did not seem inclined to lay, it



was killed on September 3rd. A second specimen, also a female, was taken at sugar on August 31st, and was kept in the same way, with the result that on September 11th three small batches of ova were deposited. The moth died on September 14th, without laying any more eggs. The ova were laid in irregular



batches, in the sheathing leaf of a dead reed-stem; they were  $1\frac{1}{2}$  mm. in diameter, yellowish in colour, round, with a smooth surface, devoid of markings. Each ovum was surrounded with a thick glutinous substance. A slight shrinking of the ova was observed on September 16th, and they ultimately proved to be infertile. I am indebted to Mr. Tonge for the photograph.

The Limes, Hadley Green, Barnet.

## LIFE-HISTORY OF *EREBIA EPIPHRON*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

As there is apparently no published description of the larva of *E. epiphron* in its last stage, I append the following complete life-history, having recently succeeded in rearing this species through all its various stages from eggs obtained from captive females last summer.

The egg is rather less than 1 mm. high, standing erect, of an oblong shape, rather fullest below the middle, a flattened crown



and rounded base. There are from eighteen to twenty longitudinal keels, some rising just below the crown, where they form a ridge, above which are angular projections; the surface between the keels is very finely ribbed transversely; the micropyle is very slightly sunken. The whole structure is irregular and asymmetrical. The colour when first laid is a bright clear yellow, which gradually becomes rather duller; on the fourth day it is speckled and blotched with pale reddish brown—these gradually deepen into rust-red; afterwards it assumes a deeper drab hue, and finally the young larva shows plainly through the delicate shell, and hatches on the eighteenth day. The larva makes its exit by eating away the crown of the egg.

Eggs laid July 6th hatched July 24th, remaining eighteen days in the egg state.

Directly after emergence the larva measures 2 mm. long. The head is large and rounded, the surface rather deeply punctured, the clypeus very finely outlined; about two dozen minute brown warts are scattered over the surface, each emitting a short whitish bristle; the eye spots are black and brown, the mouth parts ochreous and dark brown; a few longer curved bristles surround the mouth. The colour of the head is pale ochreous, the punctures rather darker.

The body has the first segment larger than the rest, and gradually tapers to the anal extremity. The surface is finely granulated, of a very pale yellowish buff, rather yellower over the ventral surface. There are in all seven longitudinal orange-tawny lines, one medio-dorsal and three on either side above the spiracles. The segments rather deeply subdivided, and have each a number of shining black warts, each bearing a short, curved, whitish, thorn-like spine, three above and two below the spiracle on each segment. The spiracle is black and shining also. The legs and claspers are unicolorous with the body.

Directly after it has emerged it eats a large portion of the empty shell, which forms its first meal.

Before first moult, when nineteen days old, it measures 4 mm. long; it is then rather stoutish about the fourth segment, whence it gradually tapers posteriorly. The colour is green, with darker green longitudinal stripes and a subdorsal and subspiracular white stripe, the dark stripes being the orange ones before feeding. The head remains unchanged.

It feeds principally at night, resting on the grass-blades during the day in a straight attitude, and falls to the ground at any disturbance. It is exceedingly sluggish in its movements. The first moult takes place about the end of the first week of August.

Shortly before second moult it measures 6 mm. long. The colour is a pale green; a medio-dorsal darker green line; a whitish subdorsal line, bordered on either side by a fine darker

green line; a grass-green spiracular band, bordered above by a fine subcutaneous whitish line, and below by a broad and conspicuous white stripe, terminating in the anal point, which is again bordered below by a grass-green band blending into the pale green of the ventral surface. The head is pale ochreous green, marked with brownish pink above the mouth, which is brown. The body is sprinkled with extremely minute dark brown warts, each emitting a tiny whitish spinous hair. The legs and claspers are tinged with pinkish brown.

Second moult end of third week of August.

After second moult, forty-five days old, it is 9 mm. long. The head is now light grass-green; in other respects it is similar in colour and markings to the previous stage. The stripes are strongly defined and conspicuous.

In this stage they enter into hybernation, gradually becoming less active and feeding at longer intervals between each meal. Hybernation commences during September, usually during the last ten days, and is continued for about five months, *i.e.* lasting until March.

During the first week of March, one larva was observed feeding on the tip of a blade of fescue-grass. During this month the larva fed by day, when the sun sufficiently warmed the temperature.

On March 31st this particular larva, when two hundred and forty days old, had attained a length of exactly 12 mm. All the colours had become richer, and the markings clearly defined; the lateral stripe pale yellowish white, and the subdorsal stripe white. In all its movements it is very slow and slug-like.

On April 6th it spun itself up for the third moult, but owing to the continuous cold, sunless weather of the first half of the month, the average day temperature being only about 40°, the larva remained undergoing the change for eight days, moulting on April 14th.

The following day it fed a little, and again once on the 16th. The next day being warm with sunshine, shade temperature 52° to 54°, it fed two or three times.

After the third and last moult, fully grown, it measures 19 mm. long. The head is globular and green, roughly granulated, and sprinkled with minute whitish bristles; mouth parts and eye spots brown and ochreous.

The body is fusiform, the anal extremity terminating in two points similar to those of *Cænonympha pamphilus* in structure, but tinged with dull ochreous instead of pink. The ground colour is grass-green, with a darker green medio-dorsal longitudinal stripe bordered by a whitish green line. It is boldly marked longitudinally with two conspicuous dull white stripes; the first is subdorsal, bordered on each side by a darker green line; the second is lateral, and stands out in strong contrast against the

darker green ventral surface; midway between these two stripes is a faint and fine whitish green line, and another broader subcutaneous line of the same colour immediately below the spiracles, which are small and have a pale yellow anterior blotch. The legs are pale olive and the claspers green. The entire surface is granular and sprinkled with minute black claw-like points, each rising from a pale spot.

Although the larvæ in captivity readily feed on *Poa annua*, *Festuca ovina*, and other grasses, its natural food-plant in a wild state is *Nardus stricta*.

When feeding on *P. annua* and other soft grasses it eats away the sides of the blades, but with *Festuca*, *Nardus*, and other hard rush-like species it eats away the ends, always starting at the extreme tip of the blade, taking slow and deliberate bites, apparently biting it through with some difficulty.

During the last stage the larvæ frequently feed in the daytime, but mostly so at night.

A larva which moulted on April 14th, 1913, for the third and last time, ceased feeding on May 14th, and pupated on the 19th, remaining thirty-five days in the last stage, and its total larval existence occupied a period of two hundred and eighty-eight days.

The pupa measures from 10 mm. to 11 mm. long; it is more elegantly formed than that of *E. blandina*, as it is without the dorsal swelling of the second and third abdominal segments, and rather more slender in proportion.

Lateral view: The head is somewhat square in front, thorax rounded, metathorax sunken, abdomen swollen at the middle, conical and tapering, anal segment terminating in a decurved elongated cremaster without any hooks, abdomen and wings running in a continuous curve ventrally.

Dorsal view: Head truncated, slightly angular at base of wings; these and the abdomen are uniform in outline, later conical, cremaster pointed.

The ground-colour varies from light yellow-green to cream. The palest cream forms have the thorax and wings pale ochreous buff, abdomen cream or pale primrose-yellow. In all forms the head is slightly darker. The head, thorax, limbs, and wings are streaked with olive-brown; the wing-streaks run parallel between the nervures and along the discoidal cell; the antennæ, tongue, and eye are strongly outlined with the same colour, and a medio-dorsal streak extends from the head to the metathorax, blending into the green dorsal vessel, which forms a slightly darker longitudinal stripe; the abdomen is more or less speckled with olive and dusky dots, some very minute, mostly running in longitudinal series; the largest spots are on the ventral surface. The thorax and abdomen are sprinkled with minute spines, and the surface is finely granular. Being without cremastral hooks, the pupa is detached, merely resting low down among the grass-stems, which



are loosely spun together, forming a very slight cocoon-like structure. At first the colour is a translucent yellow-green, palest on the abdomen, which is streaked exactly similar to the larva, each stripe corresponding precisely in form and colour; all the markings and speckles are pale olive.

The pupal state occupies about twenty-one days.

## A FOSSIL ASILID FLY FROM COLORADO.

By T. D. A. COCKERELL.

*Cophura antiquella*, n. sp.

Slender, length to end of fourth abdominal segment,  $8\frac{1}{2}$  mm.; wings 6 mm. long and 2 broad, hyaline, without markings, venation extremely pale, but apical half of costa darkened; head as preserved obtusely subconical, not as broad as thorax; antennæ about  $640\ \mu$  long, the third joint broad and fusiform, its width near base about  $160\ \mu$ ; the part basad of the third joint exhibits what look like three lateral stout processes or pectinations, but these are discordant with the other characters of the insect, and are probably due to imperfection of preservation; thorax dark, doubtless black in life; abdomen elongate, pallid, with large quadrate dark dorsal patches on the segments, as in the living *C. fur* (Williston); legs pale ferruginous, the tibiæ with a very thin, microscopical pilosity; tibiæ long, the anterior ones  $1\frac{3}{4}$  mm., the posterior ones about 3 mm., conspicuously longer than their femora, gently broadening (not abruptly swollen) apically; hind tarsi thick. Venation (measurements in microns): marginal cell open; five posterior cells, all open; anal cell closed a short distance before margin; venation normal for the genus; width (depth) of first submarginal cell at level of base of second 430; length of upper side of second submarginal 1760, its apical width 530, its width 320, from apex of wing 480; anterior cross-vein to base of second submarginal cell 1090; discal cell on first posterior 800, on second posterior 160, on third posterior 160.

Miocene shales of Florissant, Station 13 B (*Geo. N. Rohwer*).

Small *Dioctria*-like Asilidæ were evidently common at Florissant in Miocene times. The species of this group so far known may be tabulated as follows:—

Anterior cross-vein about as distant from base of second submarginal cell as the length of that cell (a good character also for recent *Dioctria*)

*Dioctria florissantina* (Ckll.).

Anterior cross-vein not nearly so far from base of second submarginal cell as the length of that cell . . . 1.

1. Second submarginal cell over 2400 microns long, its base 1309 from anterior cross-vein; anal cell open

*Nicocles miocenicus*, Ckll.

Second submarginal cell less than 1920 microns long . . . 2.



2. Second submarginal cell comparatively narrow, its depth 320 microns, from apex  $256\ \mu$  . *Taracticus contusus*, Ckll.  
 Second submarginal cell broader toward apex, its depth 320 microns, from apex  $480\ \mu$ ; wing 6 mm. long . . . 3.
3. Apical sides of discal cell equal ( $160\ \mu$ ), as in the living *Taracticus octopunctatus* and *Cophura fur*, the apical angle of the cell little greater than a right angle; venation pale . . . . . *Cophura antiquella*, Ckll.  
 Apical sides of discal cell unequal, that on third posterior twice as long as that on second, as in the living *Nicoles rufus* and *Cophura clausa*, the apical angle of the cell very much greater than a right angle; venation dark . . . . . *Taracticus renovatus*, Ckll.

These can be readily distinguished from typical *Leptogaster* by the base of the second posterior cell, which is strongly produced in *Leptogaster*. I have not found *Leptogaster* in the Florissant shales, but Professor Melander has kindly sent me a photograph of a very good specimen he found among the Florissant materials now in his hands. This fossil has the second posterior cell produced in the manner of the European *L. cylindrica* and *L. guttiventris*, and the European fossil, *L. hellii*, Unger; but the latter, if Heer's figure is correct, is very peculiar in having the anterior cross-vein meeting the basal end of the second posterior cell, and the anal cell broad in the middle and greatly narrowed apically. In the American *L. badius* the anal cell is narrowed apically as in *L. hellii*, but the second posterior cell is no more produced basally than in *Cophura*. *L. cylindrica* (*tipuloides*, Fabr.) is the type of *Leptogaster*; *L. badius*, Loew, may stand as the type of a new subgenus (or genus?).

TIPULOGASTER.—This also has the second submarginal cell shorter than in typical *Leptogaster*, while the distance between its base and the anterior cross-vein is much greater.

## FIVE MONTHS' BUTTERFLY COLLECTING IN COSTA RICA IN THE SUMMER OF 1911.

By MARGARET E. FOUNTAINE, F.E.S.

(Concluded from p. 195.)

*Dircenna euchytna*, Feld.—Five specimens, including two females from Guapiles; and one only from San José. Much rarer than *klugii*.

*Colloleria tutia*, Hew.—One female from Limon in August.

*Ithomia heraldica*, Bates.—Two males in June, and one female in July; all from San José.

*I. patilla*, Hew.—Not common at San José. I bred it from a larva found at San Antonio; it was greenish, and most insignificant

looking, but the pupa was polished gold on a green ground, and most beautiful.

*I. jucunda*, Godm. & Salv.—Taken at Guapiles and Limon, not at all abundant.

*Pteronymia fulvescens*, Godm. & Salv.—A pair from San José in July.

*Actinote anteus*, Doubld.—Only seen on the wet grassy field in front of the Pacific station at San José.

*A. melampelos*, Godm. & Salv.—One specimen only from Guapiles in April.

*A. nor.*, Bates.—One specimen caught at San Antonio, near San José, in May.

*Heliconius zuleika*, Hew.—This fine *Heliconius* we first saw at Limon in March and April. It was, however, in greater numbers and more easily caught in the baranco near Santo Domingo in July.

*H. leuce*, Doubld.—At Limon in March, April, and August. It flew high, and was difficult to catch in consequence.

*H. galanthus*, Bates.—Of this closely allied, but even more beautiful, species, one was taken at Limon in March, one at Guapiles, and two near Limon in August. It was less common at Limon than *leuce*, though I do not recollect seeing the latter at Guapiles at all.

*H. demophoon* Mén.—Mostly from San José, where it was common, though I have two specimens from Guapiles.

*H. amaryllis*, Feld.—Two only, from Limon in March and April.

*H. charithonia*, Linn.—Two from San José, where (especially at Santo Domingo) it was fairly common. They are larger, and the black is more extended than in the specimens I have from Jamaica.

*H. montanus*, Salv.—Very scarce. Only observed at San José.

*H. sara*, Fabr.—Common at Guapiles in April and May, but much less so at Limon, where it occurred in the spring, and again in August.

*Eueides hübnéri*, Mén.—Fairly common near San José, especially at Santo Domingo. I have also one very large female taken at Rio Grande on July 27th.

*E. aliphra*, Godt.—Occurred at Limon in March and April. The specimens seem rather paler than those from Trinidad.

*E. olympia*, Feld.—Occurred also at Limon. Not very common.

*Colenis delila*, Fabr.—Common at San José, also seen at Guapiles.

*C. phærusa*, Linn.—Common at Guapiles, less so at Limon. Only one specimen taken at San José, and no others seen. I bred it from Guapiles, the larva when full grown is a rich, deep, purple-brown, covered with long black spikes; it feeds like that of all the closely allied genera on a kind of *Passiflora*.

*Dione juno*, Cram.—Very common at San José in July. Occasionally seen at Limon and Guapiles.

*D. vanilla*, Linn.—Widely distributed, but most common at San José. A huge form, nearly twice as large as some of the Jamaican specimens; the larva, too, differed somewhat from those I had bred in that island, besides of course being a good deal larger.

*D. moneta*, Hübn.—Rather scarce at Cartago in May; abundant at San José in July. The larva is black, broadly speckled with yellow, and has the usual black spiracles. Feeds on *Passiflora*.

*Euptoieia hegesia*, Doubld.—Common at San José, still more so at Rio Grande.

*Phyciodes anieta*, Hew.—One specimen from Guapiles.

*P. lelex*, Bates.—Taken only at Limon. Four specimens.

*P. subota*, Godm. & Salv.—A much darker species. Common at San José; taken also at Cartago.

*P. cassiopea*, Godm. & Salv.—One female only, from Limon in March.

*P. theona*, Mén.—Scarce at San José; common, but *passé*, at Rio Grande on July 27th.

*Eresia clara*, Bates.—Two specimens from Limon in March and April.

*Synchlœ janais*, Drury.—Occurred everywhere. I found some larvæ at San José feeding on a kind of *Pilea*. It is black with red spots, and is thickly covered with short brown spines. The pupa is pale straw colour, streaked and spotted with black.

*S. lacinia*, Hübn.—One specimen taken at Cartago. Fairly common at Rio Grande.

*S. hippodrome*, Hübn.—This beautiful species we first saw flying over the smooth surface of a slowly flowing river, which crept through the swampy forest near Limon. We did not see it at Guapiles or San José; but at Rio Grande it was one of the commonest species there.

*S. pæcile*, Feld.—Two females only, both taken at Rio Grande.

*S. narva*, Fabr.—One male only from Guapiles.

*S. gualialis*, Bates.—Not uncommon at one place in the bush near Guapiles; females very scarce.

*Dynamine ate*, Godm. & Salv.—At Limon in March and April.

*D. salpensa*, Feld.—Two males from Limon in April.

*D. thalassina*, Boisd.—A male and female from Limon in April.

*Callicore astata*, Guér.—Bersa caught one specimen of this lovely butterfly on wet mud in the neighbourhood of the Savannah, at San José.

*Ectima rectifascia*, Butl.—One only from Guapiles.

*Pyrrogyra otolais*, Bates.—One specimen only from Limon in March.

*Adelpha iphiola*, Linn.—One taken at Limon in March.

*A. cytherea*, Linn.—Not uncommon at Limon in March and April. Difficult to take in good condition.

*A. mephistopheles*, Butl.—I caught one specimen on the Savannah, at San José. We did not see any others.

*Vanessa huntera*, Fabr.—Several taken at San José.

*V. cardui*, Linn.—This cosmopolitan butterfly was flying about the flowers in the Public Gardens at Cartago in May.

*Timetes chiron*, Fabr.—Occurred at Guapiles, and much more plentifully at San José.

*T. coresia*, Godt.—At Cartago and San José: scarce in both localities.

*T. marcella*, Feld.—Cartago and San José; also rather scarce.

*T. petreus*, Bates.—One specimen from Guapiles. A continuous occurrence of individuals of this species was observed by me one day at San José, passing overhead, always in the same direction, though not more than one at a time. Unfortunately they were invariably out of reach of the longest handled net, which was all the more annoying as they appeared to be in perfect condition, suggestive of recent emergence.

*Eurema lethe*, Fabr. — Taken only near San José. Not at all common.

*Epiphile adrasta*, Hew.—Only one taken at San José; no others observed.

*Junonia lavinia*, Cram.—Recorded only from San José, but I feel sure I saw it in every other locality we visited.

*Anartia jatrophae*, Linn.—Common in one place just outside the town of Limon. Occurred, but not very commonly, at Guapiles.

*A. fatima*, Fabr.—Abundant everywhere.

*Annæ glycerium*, Doubld. & Hew.—Only seen near San José, not uncommon, but rather difficult to catch, and often damaged.

*Cœa cadmus*, Cram.—One specimen only from Guapiles, where a few others were observed.

*Amphirene epap'us*, Latr.—Scarce at Guapiles in May, but very common at San José in June and July, especially on the *Lantana* flowers, in the baranco near Santo Domingo.

*Ageronia ferentina*, Godt.—One from Guapiles, and one from Limon; several others were seen.

*Gynæcia dirce*, Doubld. & Hew.—I did not once see this butterfly on the wing in Costa Rica, and am only able to include it in this list because a small larva I found at Limon, feeding on the leaves of the trumpet-tree (*Cecropia peltata*), produced a fine male of this species, which was previously quite unknown to me: though some months later in Jamaica and Trinidad, in localities where *dirce* was fairly common, I bred a good many more. The larva is velvety black, with two long, spiky horns protruding from the head, of a brownish-drab colour, and it is ornamented throughout with spiky spiracles of a pale lemon-yellow colour, changing to white in the immediate region of the head.

*Smyrna karwinskii*, Hübn.—I took one specimen of this butterfly close to the station at Rio Grande, while we were waiting for the train to take us back to San José. It was so cryptic when settled that had it not been for the sharp eyes of a small Spanish boy, who earned a well-merited half-colon for his most desirable assistance, I should never have detected it. The specimen was absolutely fresh, but had two slight injuries to the lower wings, so entirely alike and symmetrical that at first I thought it was their natural shape.

*Limnias pixe*, Boisd.—First taken at Guapiles, fairly common at San José in June; but unfortunately I failed to discover that it was not a moth till later on in July, when but few of the specimens were worth netting.

*Nymphidium lyorias*, Hew.—One from San José in July.

*Euchenais aristus*, Stoll.—Two from San José in June.



*Lemonias lilina* (?), Butl.—One from San José in July.

*Emesis ops*, Latr.—One from San José in July.

*E. ocypore*, Geyer.—One from Guapiles in May.

*E. lupina*, Godm. & Salv.—Neither sexes scarce at San José in July.

*Cremna umbra*, Boisd.—One from Guapiles in May.

*Charis macularia*, Boisd. — Also only one from Guapiles in May.

*Pierella luna*, Fabr. — A few taken in a cocoa plantation at Sabborio, near Limon, in August. Seen nowhere else.

*Euptychia hermes*, Fabr.—At Guapiles and Limon.

*E. hesione*, Staud.—Also only seen at Guapiles and Limon. Very difficult to find in good condition.

*Thecla hesperitus*, Butl. & Druce.—One specimen only from San José in July.

*T. empusa*, Hew.—One specimen caught at San José the same day as *hesperitus*.

*T. azurinus*, Butl. & Druce.—I caught one beautiful specimen at Guapiles in April.

*T. beon*, Cram.—Not uncommon at Limon in April.

*T. aufidena*, Hew.—One male and one female, both caught by Bersa on the same day at Limon in April.

*T. togarna*, Hew.—Occasionally met with at Limon, and afterwards at Guapiles.

*T. phæa*, Godm. & Salv. — Two specimens from Herr Brade's garden near San José in July.

*Timolus basalides*, Geyer.—Two specimens from San José in June and July.

*Rekoa meton*, Cram. — Occasionally seen and captured near San José.

*Chilades theonus*, Lefebvre.—One from Limon in March.

*Epargyreus zestos*, Hübn.—One from San José in July.

*Telegonus alardus*, Stoll.—One from San José in July. Others were seen, but it seemed to be very difficult to come across this beautiful "skipper" in good condition.

*Pyrrhopyge venezuelæ*, Doubld. — One (very fine) taken at Rio Grande.

*Thymele fugerator* (?), Walsh.—I bred several of what I believe to be this species at San José, in June and July, from larvæ found when very young on a kind of wild sweet pea. The young larva creates for itself a little tent-shaped covering on the edge of the leaf by eating away a narrow groove, and then turning over a piece of it, and securing it by a web in the position desired, from which it only emerges to feed. When full-grown it is a beautiful object, bright apple-green, thickly irrorated with lemon-yellow. The head is shiny russet-brown, with an orange spot on either cheek; the rudimentary legs are red.

*Eudamus proteus*, Linn.—I saw this butterfly not unfrequently but having already secured a long series in Cuba, all I seem to have from Costa Rica is one bred specimen from a larva I found while searching for the preceding, which it resembles in its habits.

*E. nigricauda*, Mabille.—Bred on a coarse kind of grass, from an ovum I saw laid by a wild female at Limon in April. The full-fed larva is a rich russet-brown, with a row of seven white dots on either side. The head is shiny black.

*Achlyodes ozotes*, Butl.—Fairly common at San José in June and July.

*Antigonus nearchus*, Latr.—Taken only at Limon in April, and again in August.

*Eantis* (?).—A large dark brown velvety species, which is well represented at South Kensington, but appeared to be at present unnamed. I have one from Limon.

*Thanaos clitus*, Edw.—This pretty white-fringed "skipper" was very common at Santo Domingo in June and July.

*Pellicia bipuncta*, Schaus.—One specimen from Limon in August.

*P. nyctineme*, Butl.—Also only one specimen from Limon in August.

*Systasea erosus*, Hübn.—One specimen from Limon in April, and one from Rio Grande in July. Several others were seen.

*Chiomara mithrax*, Möschler.—One specimen from Limon in April.

*Cocceius pylades*, Scudder.—Two specimens from San José in June and July.

*Xenophanes tryxus*, Cram.—One from Limon in April, and one from San José in July. Several others were seen.

*Theagenes hamatospila*, Feld.—One worn female from Limon in April.

*Carystus cynaxa*, Hew.—The larva of this "skipper" feeds on the palm-leaves, and I occasionally came across it while looking for the larvæ of *Opsiphanes crameri* at San José. I have three specimens bred from larvæ, and one from a pupa found by Mr. Alan Wood. Both are white and chalky in texture.

*Atarnes sallei*, Feld.—One from San José in July; no others observed.

*Mylon zephus*, Butl.—One from San José in July; few others were seen.

*Heliopetes laviana*, Hew.—Fairly common at Santo Domingo in June and July.

*H. arsalte*, Linn.—Males very common at Limon in March, April, and August. One specimen (a female) from San José, the only female I have, and the only specimen I took in that locality, where this butterfly was decidedly scarce.

*Hesperia syrichtus*, Fabr.—Common all over.

Before concluding these notes, I should like to express my grateful thanks to Mr. N. D. Riley, and also to Mr. W. Schaus, for the very kind help they gave me in the somewhat difficult task of identifying my specimens in the National Collection at South Kensington.

February 16th, 1913.

## NOTES AND OBSERVATIONS.

THE KING AND THE ENTOMOLOGICAL SOCIETY OF LONDON.—At the last meeting of the Entomological Society of London it was announced that H.M. the King had been pleased to become a patron of the Society. This is the first occasion when the Sovereign has demonstrated officially his interest in our branch of science and the work associated with it, and we offer, therefore, our brother entomologists hearty congratulations upon the honour conferred on them. For those of us who have been present when His Majesty has been the guest of the Royal Society know very well that his interest in matters scientific is something more than formal. But many years have elapsed since a meeting of the Society was honoured by the presence of Royalty. The first (and last) royal names signed in the Fellows' Obligation Book are those of the Princess Victoria (afterwards Queen-Empress), and of her mother, the Duchess of Kent, who were present soon after the foundation of the Society in 1833.

CRANE-FLIES AND SWEETS.—In a lane here on May 23rd I was much struck by the unwonted attitude of a female *Tipula peliostigma*, which was sitting on a dog-wood leaf in the hedge with her body closely adpressed. This appeared so unusual in the insects of the present genus, which seem to invariably stand high upon the tips of their elongate legs, that I looked more closely, and found that she was greedily sucking the honeydew which had fallen from a batch of the Aphidid, *Drepanosiphum acerina*, Walk., on a superimposed maple shoot. I have never met with *Tipulæ* on honeydew before, and consider the incident remarkable; but that the genus is fond of sweets is, I believe, a well-known fact. *Tipula marmorata* and *T. confusa* were both taken on overnight "sugar" in a north-east wind on the afternoon of September 23rd, 1898, in Bentley Woods, near Ipswich (along with several *Limnobia bifasciata*, Schr., which had occurred in the same situation on both the 13th of the same month and August 10th, 1895); and I find in my diary a note under September 9th, 1907, that on that day a female *Tipula oleracea* was observed by me "distinctly sucking the sweets from the stylopods of *Angelica sylvestris* by the River Waveney" at Beccles, in Suffolk.—CLAUDE MORLEY; Monks Soham House, Suffolk.

INDIAN ICHNEUMON SYNONYMY.—It may be well to put on record the synonymy of the fourteen species inadequately described by Peter Cameron in 1897 (Manchester Phil. Soc. Memoirs, 1897, no. 4, pp. 3 *et seqq.*), of which I have examined all the types:—(1) *I. agracensis*, male, = *Ischnojoppa luteator*, Fab. Ent. Syst. Suppl. 1798, p. 222. (2) *I. appropinquans*, female, = *Myermo rufipes*, Cam. Ann. Nat. Hist. vii. 1901, p. 524, female. (3) *I. buddha*, female, = *Ichneumon buddha*, Cam. (closely allied to *I. extensorius*, Linn.). (4) *I. clotho*, female, = *Lareiga alboannulata*, Cam. Zeits. Hym.-Dip. 1905, p. 246, female. (5) *I. confusaneus*, female, = *Phacogenes confusaneus*, Cam. (hardly distinct from *P. impiger*, Wesm.). (6) *I. hypocrita* = *cratocryptus* (Thoms. = *finchra*, Cam. Zeits. Hym.-Dip. vii. 1907, p. 163) *hypocrita*, Cam. (7) *I. inquietus* = *Oiorhinus inquietus*,

Cam., female (the clypeal structure is distinct). (8) *I. intaminatus*, male, = *cratocryptus* (Thoms., nec Cam., Journ. Str. Br. R. Asiatic Soc. xliv. 1905, p. 141 = *suvatta*, Cam.) *intaminatus*, Cam. (9) *I. integratus*, male, = a *Fileanta*, very like the next species. (10) *I. numericus*, male, = *Fileanta numerica*, Cam. (closely allied to *F. balteata*, Cam. Ann. Nat. Hist. vii. 1901, p. 526). (11) *I. rothneyi*, female (sic male), = *Protichneumon* (= *Amblyjoppa*, Cam.) *rothneyi*, Cam. (near *P. pisorius*, L.). (12) *I. taprobana*, female, = a typical *Amblyteles*, possibly a mere form of *A. uniguttatus*, Grav. (13) *I. vacillans*, male, = *Exetastes vacillans*, Cam. (allied to *E. lucifer*, Morl.). (14) *I. vishnu*, male, = *Barichneumon vishnu*, Cam.—CLAUDE MORLEY; May, 1913.

GIFT OF BUTTERFLIES TO LEEDS UNIVERSITY.—The University of Leeds has recently received a valuable addition to its scientific collections in the presentation by Mrs. A. H. Clarke, of Earl's Court, of the collection of Continental and Exotic Macro-Lepidoptera made by her late husband, who was one of the Senior Fellows of the Entomological Society, and, up to a few years of his death in 1911, a frequent contributor to the 'Entomologist's Record.' Mr. Clarke's pursuit of entomology was a lifelong recreation in the intervals of a busy City career. In earlier years he was an active butterfly hunter, both in England and upon his holiday tours abroad, and the specimens so acquired formed the basis of his British and European collections, the latter of which (containing some 6500 specimens) is included in Mrs. Clarke's donation to the University. Mr. Clarke also got together, by judicious purchases extended over many years, one of the most representative collections of exotic butterflies in the possession of any amateur. This part of the collection consists of nearly 6000 specimens from all parts of the world, and is particularly valuable as a reference collection, not merely from the number and careful selection of the forms represented (some being of great rarity), but from the perfect condition and beauty of the specimens themselves. The whole donation enriches the entomological resources of the University by over 12,000 specimens, all carefully set, arranged and labelled; and to this Mrs. Clarke has generously added her husband's working library of entomological literature, itself a present of great value and utility. The University authorities wish it to be known, in conformity with Mrs. Clarke's desires, that, after the immediate work of arranging and cataloguing has been concluded, the collections will be available for reference by entomologists generally upon application to the Professor of Zoology at the University.

PHRYXUS LIVORNICA AT CLIFTON.—It may be of interest to record that a fine male *Phryxus livornica* was captured by Mr. Cyril H. Walker, F.R.C.S., on June 2nd last. It was hovering over flowers in his garden in Oakfield Road, Clifton.—GEO. C. GRIFFITHS; Penhurst, 3, Leigh Road, Clifton, Bristol.

COLIAS EDUSA NEAR COLCHESTER.—On June 14th I saw a specimen of *Colias edusa* flying swiftly just outside Wivenhoe Station near here.—B. S. HARWOOD: 62, Station Road, Colchester.



**COLIAS EDUSA IN ESSEX.**—While I was cycling yesterday on the high-road between Brentwood and Chelmsford, twenty-two miles from London, a fine male specimen of *C. edusa* passed within a yard of me, going at a great rate before the wind and was over the hedge before I could dismount. The day was very hot and sunny, with a strong south-west wind, and there was a large clover field in the direction it had come from. It was apparently freshly emerged. Is not this very early and unusual?—R. S. GWATKIN-WILLIAMS, Commander R.N.; 70, Lissenden Mansions, Highgate Road, N.W., May 31st, 1913.

**COLIAS EDUSA IN HERTFORDSHIRE.**—On May 30th I took a fine male specimen of *Colias edusa* on the chalk hills about five miles from Hitchin. It appeared to be perfectly fresh. I hear that another specimen, also a male, was seen near Hitchin on or about the same date. We do not commonly see this butterfly in Herts except in "*edusa*" years. Perhaps this year will be one?—A. H. FOSTER; Hitchin, Herts.

**COLIAS EDUSA IN KENT.**—I have pleasure in recording the capture of two female *C. edusa*, a pair *in cop.*, and several males at Folkestone on June 15th and 16th. All, especially the females, were in very bad condition and evidently immigrants. I may add that I only saw one specimen of *Pyrameis atalanta* and two examples of *P. cardui* during four days' stay.—L. W. NEWMAN; Bexley.

**COLIAS EDUSA NEAR LONDON.**—On June 3rd, about 12.45 p.m., I had the pleasure of seeing a female *Colias edusa* flying in Kew Gardens.—B. W. ADKIN; 8, Hope Park, Bromley, Kent.

**COLIAS EDUSA IN SUSSEX.**—On June 2nd I saw three specimens of *C. edusa* (two males, one female) near Hailsham; and on June 13th I found males of the species flying freely at Beachy Head.—J. T. DEWEY; 79, Hurst Road, Eastbourne.

I have to-day seen three specimens of *Colias edusa*; I was so surprised that I stopped to watch them, and one settled close to my feet.—WM. A. CAREY; 36 and 38, Devonshire Road, Bexhill-on-Sea, June 17th, 1913.

**DRUCE COLLECTION OF LEPIDOPTERA.**—A magnificent collection of butterflies and moths, with its many types, formed by the late Herbert Druce, Esq., has passed into the Joicey Collection at "The Hill," Witley, Surrey, with the exception of the *Lycenidæ* and *Hesperidæ*, which are retained by Hamilton H. Druce, Esq. Entomologists are cordially invited to use the collection for naming and comparing.

**ENTOMOLOGICAL CLUB MEETINGS.**—May 19th, at Simpson's Tavern, 100, Strand. Mr. Alfred Sich in the chair. Other members present were Messrs. Adkin, Rowland-Brown, and Donisthorpe. June 17th, at Wellfield, 4, Lingards Road, Lewisham, S.E. Mr. Robert Adkin in the chair. Messrs. Hall, Rowland-Brown, and Sich

were the other members who attended. Several other entomologists were present, as guests, on each occasion.—RICHARD SOUTH (*Hon. Sec.*).

## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*May 8th.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. E. B. Haynes, of Wimbledon, was elected a member.—Mr. H. E. Page exhibited a short series of *Erebia zapateri* taken by him in Spain, and which he was placing in the Society's cabinet.—Mr. Hugh Main, two living field-cricket from Lisbon in the curious cage in which they are kept for "singing." One specimen gave an exhibition of his power in the room.—Mr. J. Platt Barrett, larva and pupa of *Thera variata* on spruce from the New Forest, and two fine Saturniids from Nairobi.—Mr. Sieh, Rhopalocera from the South Tyrol, *P. machaon*, *P. podalirius*, *Lybithea celtis*, *Scolitantides orion*, *Glaucopsyche iolas*, &c., and read a paper entitled "Spring in the South Tyrol."

*May 22nd.*—Mr. A. E. Tonge, President, in the chair.—Messrs. Edwards, West (Ashted), and Carr, exhibited pale blotched examples of *Epinephele jurtina*; Mr. Adkin, a series from various British localities, some near var. *hispulla* and one ab. *splendida*; Mr. Gibbs, a series from Algeria, Corsica, Balkans, Vosges, Jura, &c., including var. *hispulla*, var. *fortunata*, var. *taurica*, &c., and short series of other species of the genus, *E. janioides*, *E. ida*, *E. pasiphaë*, *E. tithonus*, with many vars. and aberrations; Mr. Hy. J. Turner, a series from Portugal, Spain, Pyrenees, Teneriffe, Hyères, Corsica, Algeria, Crete, Greece, Turkey, Switzerland (many places), Niederwald, Juras, French Alps, &c.—Mr. Main, colour photographs of *Tephrosia crepuscularia* taken by himself.—Mr. Tonge, bred series of *Lobophora carpinata* from Tilgate Forest; two specimens were distinctly green tinged.—Mr. Turner read a paper entitled "One of our Common Butterflies, *Epinephele jurtina*," showing the growth of our knowledge of the species from the time of Linnaeus, 1758, and the consequent growth of the nomenclature.

*June 12th.*—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. R. Adkin exhibited tobacco leaves that were much infested by a species of beetle which was afterwards identified as *Anobium panicum*. The tobacco came recently from Turkey.—Mr. West (Greenwich), a series of the new hemipteron, *Psylla albipes*, discovered by him on white-beam tree.—Mr. Coxhead, blackthorn leaves with galls of the dipteran, *Cecidomyia pruni*, from Shooter's Hill.—Mr. Cowham, an aberration of *Abraxas grossulariata* with the black markings on the fore wings coalesced to a wide band suppressing the usual yellow markings.—Mr. H. Moore, larvæ of the stag-beetle, *Lucanus cervus*, from Lewisham.—Mr. Blenkarn, a series of *Bruchus pisi*, a coleopteron found by Mr. Main in split peas in a Woodford shop, and a pair of the rare *Pterostichus parumpunctatus* taken at Chopwell,

Northumberland, in May, 1912.—Several reports were made of the occurrence of *Colias edusa*, *Pyrameis atalanta*, and *P. cardui*.—H. J. TURNER (*Hon. Report. Sec.*).

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—Meeting held in the Manchester Museum on March 5th, 1913.—Mr. J. H. Watson exhibited male and female *Hypolimnas anthedon* from British East Africa; the female mimics *Limnas chrysippus* (which was also shown) to a remarkable degree. He also showed a series of *Hypolimnas bolina*, male and female, from Fanning Island, in the Central Pacific. This is the only butterfly found on the island, and the female is the most brilliant form of *bolina* female known. Mr. Watson suggested that the female is reverting to the brilliant male colour, because it cannot profit from mimicry of another insect which does not occur there; in other localities the *bolina* female mimics other butterflies of a more sober appearance.—Mr. A. E. Salmon gave a lecture with lantern illustrations entitled "Plants that Prey on Insects." He divided these into three classes: (1) Plants which capture insects without making any definite movement for that purpose, such as the bladderwort, the pitcher-plant, and the toothwort. (2) Those which make definite movements to capture after stimulation has been given by the insects themselves, such as the sundews, the Venus fly-trap, and the butterwort. (3) Those which have sticky or limed leaves, such as the Spanish fly-catcher or dew-leaf. He exhibited leaves of the pitcher-plant containing many insects.—A. W. BOYD, M.A., *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, April 21st, 1913.—Mr. F. N. Pierce, F.E.S., President, in the chair.—Messrs. Alan Cookson, Blundell Sands, and Alfred Watts, Oxtun, were elected members of the Society.—Mr. R. Wilding gave an address entitled "Notes on Some Rare and Local Coleoptera, in the course of which he gave details of the haunts and habits of the following species, viz.:—*Miscodera arctica*, *Amara rufocincta*, *Bembidium 5-striatum*, *B. nigricorne*, *Cymindis vaporariorum*, *Perileptus arcolatus*, *Ocypus fuscatus*, *Quedius auricomus*, *Pseudopsis sulcatus*, *Heptaulicus villosus*, *Ægialia rufa*, *Ammæcius brevis*, *Anisotoma ciliaris*, *A. rugosa*, *Anthicus bimaculatus*, *Antherophagus silaceus*, and *Chrysomela cerealis*. Mr. Wilding exhibited series of all these species in illustration of his remarks. A discussion ensued on the bionomics of the less known species occurring on the sandhills, from which it appeared that a good deal of research is still required, especially in connection with the larval habits.—Mr. Alfred Watts exhibited two specimens of *Heliaca tenebrata* captured by himself near Birkenhead.—Mr. W. Mansbridge showed *Epinephele janira*, *Ino statices*, and *Lycaena icarus*, all very brightly coloured, from Co. Cork.—WM. MANSBRIDGE, *Hon. Sec.*

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## A SUMMARY OF THE PRESENT KNOWLEDGE OF THE PROTUPA.

By C. B. WILLIAMS, B.A., F.E.S.

THE only publication at present on the Protura in English is a rather short and popular article by Mr. R. S. Bagnall [1],\* in which he gives the first record of their occurrence in Britain. The object of the present paper is to give more fully an account of this order, in the hope of calling the attention of English entomologists to the many interesting and unique characters which they possess, and also to give some account of the different views held on the much-debated question of their systematic position.

The Protura are a group of minute, wingless arthropods, probably insects, the largest of which are not two millimetres in length. The most notable feature on first examination is the absence of antennæ, which differentiates them immediately from all known insects (except the almost structureless female of the Strepsiptera) and, together with their lack of wings and elongate general appearance, has doubtless long caused them to be mistaken for larvæ when, or if, they had been seen. A pointed head, three pairs of rather long legs, and a truncate many-segmented abdomen without cerci are also characteristic features, while on closer examination minute appendages may be made out on the ventral side of the first three abdominal segments.

The group was first described so short a time ago as 1907 by Silvestri [18], from Italy, one species *Acerentomon doderoi* being described. In the following year Berlese published two short papers, the first [3] describing a new genus and four new species, the second [4] describing three more species, and giving some account of their internal structure. In 1909 appeared a short note by Börner [7, p. 125 footnote]; descriptions of a species from America by Silvestri [19]; and then Berlese's large monograph [5] which still remains by far the

\* The numbers in square brackets refer to the Bibliography at the end.



most complete work on the group. Since that date many other papers have been published, which will be referred to later as necessary.

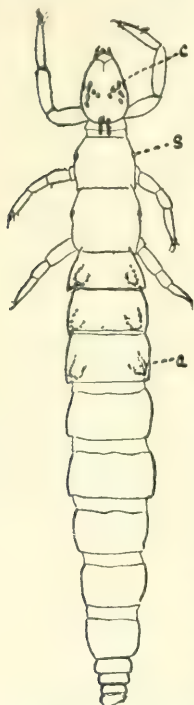


Fig. 1.—Diagram of *Eosentomon*. a. position of ventral abdominal appendages (shown dotted). s. spiracle. c. "concretions" in the head and prothorax.

The Protura are found in various habitats. In this country Bagnall has taken them under stones and under bark of trees, and I myself, by means of a Berlese funnel,\* in peat and turf. Abroad they have been found in similar situations and also in moss. Rimsky-Korsakow [15] describes them as being solitary, and usually I found them only one or two at a time, but on one occasion I obtained fifty from one small block of peat, while Bagnall [1] alludes to finding them "in profusion."

In connection with the absence of antennæ, they have developed the interesting and remarkable habit of walking on the two hind pairs of legs, with the rather elongate front pair held forward in front of the head, and acting as tactile organs. Moreover, it is found on examination that the tarsi of the front legs are provided with a number of well-developed sense hairs, which enable them the more efficiently to take on their unusual function. This habit, which is extremely interesting to watch in living specimens, recalls a somewhat similar one seen in several Acarids, more especially those with long front legs.

Their food is not definitely known, but the structure of the mouth indicates that hard food is not taken, and it is probable that the bark-inhabiting species eat soft tissue or sap, and the ground species decaying vegetable matter. They have never been bred, but larval forms of several species have been taken, differing from the adult in having a smaller number of abdominal segments. Eggs have not yet been found, but the comparatively large size of those seen in the oviducts seems to indicate that only one or two are laid at a time.

The systematic position of the Protura has been the subject of much debate and cannot yet be said to be finally settled. There are so many conflicting and unusual characters that it is doubtful whether to consider them as insects, as Myriapods, or as a separate class intermediate between the two. It will be best before discussing the various views to consider in more

\* I hope to give an account of this interesting apparatus in a future number of this Journal.

detail the chief structural points on which their systematic position will depend.

The antennæ are completely absent in all known forms, Schepotieff's account of the antennæ of *Protapteron indicum* [16] having been shown by Rimsky-Korsakow [13] to have been an error.\*

The mouth parts are entotrophic and somewhat resemble those of the Collembola. There are a pair of simple style-like mandibles and two pairs of maxillæ (or maxillæ and labrum), each consisting of an inner and an outer lobe and a jointed palp. The maxillary palp is much larger than the labial palp and projects beyond the head at each side of the mouth.

The number of abdominal segments in the adult is twelve, a number which is not found in any insect except in the embryonic stage. The earliest known larval stage, however, has only nine segments, the remaining three being interpolated, one at a time, between the ultimate and penultimate segments. This increase in the number of segments during life, or anamorphosis, is a Myriapod character, though in these the segments appear in groups (*e. g.* in *Julus terrestris*, five at a time).

The abdominal appendages are situated in pairs on the first, second, and third abdominal segments. In the family Eosentomidæ (see later for classification) all are two-jointed, the second joint being small, retractile into the first, and with a small protrusible vesicle at the tip; in the Acerentomidæ, however, only the first pair are two-jointed, the others consisting of a single joint and all being much smaller than in the previous family.

Anal cerci are completely lacking, and the terminal segment is truncate and shaped not unlike the telson of a crustacean, to which character they owe their name "Prot-ura," "primitive tail."

The genital system in the female consists of two ventral paired ovaries and oviducts, each side forming a large straight unbranched tube reaching from about the metathorax to the ninth segment, where they unite into a short vagina and open by a single pore between the eleventh and twelfth segments. In the male there are two large testes which unite in front at about the level of the mesothorax, and long curled vasa deferentia opening separately on the penis, which can be protruded between the eleventh and twelfth segments.

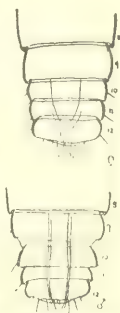


Fig. 2.—Diagrams of terminal segments of male (below) and female (above).

\* Rimsky-Korsakow also states that Schepotieff was mistaken in his accounts of the mouth parts, abdominal appendages, and genital opening, and that his species *Protapteron indicum* is a quite typical member of the genus *Eosentomon*.

The sexes may be distinguished by the structure of the genitalia in the last few segments as shown in fig. 2.

The tracheal system is completely absent in the Acerentomidæ, but in the Eosentomidæ there are two pairs of lateral stigmata, one pair on the mesothorax and the other on the metathorax. According to the most recent account, that of Prell [10], the tracheæ from the front spiracle supply the head, thorax, and the two hind pairs of legs; and those from the posterior spiracle supply the hind pair of legs and the abdomen. The front legs are without tracheæ, while the hind pair are supplied from both spiracles, but the two systems do not communicate. Berlese's account differed slightly from this, and may be consulted in his monograph 5.

The nervous system consists of a supra-œsophageal ganglion in the head, which has a prolongation behind into the prothorax, a sub-œsophageal ganglion fused with the prothoracic ganglion, and a double ventral nerve-chord with ganglia in the meso- and metathorax and on each of the first six abdominal segments, that in the sixth segment being larger than the preceding ones. There are also supplementary ganglia in the thorax at the base of each leg.

In the head and prothorax of some species of *Eosentomon* there are several remarkable structures called "konkremente" (concretions) by Rimsky-Korsakow [14]. These are small, dark, almost round bodies, apparently isolated, of which there are five pairs near the dorsal surface in the head, and three pairs in the prothorax near the ventral surface. They are arranged symmetrically, but are liable to be displaced and pressed over one another in mounted specimens. They were first described by Schepotieff in his *Protapteron indicum* [16] as "innere einschlüsse"; he, however, only mentions five as present in the prothorax. They were next mentioned by Rimsky-Korsakow [*l. c.*] in his species *Eosentomon silvestrii*, and they occur in a species of the same genus, closely related to and possibly identical with this last, which I have taken in some numbers in England. Their function is quite unknown. Rimsky-Korsakow suggests that they are the accumulated secretion of some gland, while Schepotieff [16, p. 341] considers them similar to Belese's "corpora allata," which the latter describes on the head of *Acerentomon* and *Eosentomon*.

True eyes are lacking, but there are, one each side of the head, rather nearer the front end, a pair of organs called "Pseudocelli" by Berlese. Their function is not understood. Becker [2, p. 398] considers them related to the "post-antennal organs," which he describes in Collembola, and suggests that they may have a vibratory function.

The alimentary canal is a simple, straight tube, widening in



the mesothorax to a long cylindrical mesenteron. About the region of the sixth abdominal segment this contracts again to the narrow hind intestine, and at the junction there are six very short Malpighian tubes, arranged in two groups of three.

The muscular system, which is not of much interest in the present discussion, has been fully worked out by Berlese [5] and Prell [12], while other points of interest are the paired glands which open on the eighth abdominal segment, and the presence of a single claw on the tarsus which is a Collembolon and Myriapod feature.

The various views which have been put forward as to the systematic position of the Protura depend chiefly on the relative importance which the writers assign to the various structural characters we have considered, the whole question being the more difficult as, in the absence of any knowledge of their embryology, it is often impossible to decide whether any particular feature is primitive or the result of specialization.

Silvestri [18] first described them as an order Protura of the subclass Apterygota of the Insecta. Berlese [5], considering the lack of antennæ, the anamorphosis, and the large number of segments, removed them from the Insecta and treated them as an order Myrientomata of the class Myriapoda.

Schepotieff [16] united them with Campodea as a suborder Prothysanura of the Thysanura.

Borner [8], considering the entotrophic mouth-parts, and the lack of anal cerci to be more important than the lack of antennæ, which he believes to be secondary, makes them an order of the Apterygota, and proposes the following classification for that subclass:—

Subclass APTERYGOTA.

Super Section Ectotropa.

Order 1. Archeognatha ... Machilidæ.

Order 2. Thysanura ..... Lepesmatidæ and Nicoletidæ.

Super Section Entotropa.

Section a. Archinsecta.

Order 3. Diplura ..... Campodeidæ, Japygidæ, and Anagapygidæ.

Section b. Ellipura.

Order 4. Protura..... (Protapteridæ) Eosentomidæ, Acerentomidæ.

Order 5. Collembola ..... Poduridæ, Entomobryidæ, Ne-elidæ, Sminthuridæ.

At this time the supposed possession of antennæ by *Protapteron* had not been contradicted, and their presence in a Proturon would have given more justification to the close relation which Borner supposes between these insects and the Collembola.

Rimsky-Korsakow [13] considers the absence of antennæ may



be secondary, and draws a comparison between the small head, lack of antennæ, and prolongation of the head ganglion into the prothorax as found in the Protura, and a similar combination in many insect larvæ. He does not attach much importance to the mouth-parts for deciding the systematic position, but believes that the anamorphosis and the large number of abdominal segments must be primitive, and also the abdominal appendages and the position of the genital opening, which separate them at once from the Collembola. He proposes to consider them as a class Myrientomata, between the Myriapoda and the Insecta.

Prell [10] regards the anamorphosis as the most important and primitive character, while the number of abdominal segments, the position of the genital opening, and the abdominal appendages, although also primitive, are of less importance. The lack of antennæ and cerci, on the other hand, are secondary, as also is the reduction of the tracheal system in the Acerentomidæ. He proposes the following arrangement:—

Class INSECTA.

Subclass Anamerentoma (with anamorphosis).

Order Protura (with twelve abdominal segments; no antennæ, &c.)

Subclass Holomerentoma (with no anamorphosis).

All the other Insecta.

This classification seems to be the most sound yet put forward, as it points out the undoubted affinities which the Protura have with the Insecta, but at the same time recognizes the fact that they differ from the other orders of Insecta to a greater extent than these do among themselves.

Prell does not think that the Protura are to be considered as in any way the direct ancestors of the Holomerentoma, but as a group which branched off from the ancestors of the Insecta at a very early date, long before the origin of wings, and which has since become largely modified and specialized.

The further subdivision within the order presents no great difficulties at present. The species fall naturally into two families, containing three genera, with the chief characteristics as follows:—

Family I.—ACERENTOMIDÆ. Tracheal system absent. Second and third abdominal appendages consisting of a single joint. Dorsal pleurites of the eighth abdominal segment with comb-like posterior margin.

Genus 1.—*Acerentomon*. Labrum produced anteriorly into a long process. Maxillary palps 4-jointed. Labial palps 3-jointed. Mandible terminating in a very long pointed style.

Three species.—*A. doderoi*, Silvestri [18]; *A. microrhinus*, Berlese [5]; *A. affinis*, Bagnall.\*

\* The description of this species, hitherto [1] only mentioned by name, will, I believe, appear in the Ent. Mo. Mag. for August, 1913.

Genus 2.—*Acerentulus*. Labrum not produced. Mandible without long style. Maxillary palps 3-jointed. Labial palps 2-jointed, but the basal joint is very indistinct.

Six species.—*A. confinis*, Berlese [3]; *A. tiarneus*, Berlese [4]; *A. cephalotes*, Berlese [3]; *A. gracilis*, Berlese [4]; *A. minimus*, Berlese [3]; *A. perpusillus* Berlese [5].

Family II.—*Eosentomidae*. Tracheal system present. Three pairs of abdominal appendages, larger than in the *Acerentomidae*, and all 2-jointed. Palps as in *Acerentulus*.

Genus 3.—*Eosentomon*. With the characters of the family.

Seven species and one variety.—*E. transitorium*, Berlese [3]; *E. ribagai*, Berlese [5]; *E. Wheeleri* and var. *mexicana*, Silvestri [19]; *E. (Protapteron) indicum*, Schepotieff [16]; *E. Silvestrii*, Rimsky-Korsakow [14]; *E. germanicum*, Prell [12]; *E. jabanicum*, Berlese [6].

Both species, which I have taken in England, belong to the genus *Eosentomon*, but representatives of all three genera have been taken by Mr. Bagnall.

Abroad their known distribution is being rapidly extended, and now includes EUROPE: Italy (Berlese, Silvestri), Russia, Austria, Finland (Rimsky-Korsakow), Norway (Prell), Sweden (Traghardt), Germany (Borner, Prell, Rimsky-Korsakow); ASIA: India (Schepotieff); AMERICA: United States, Mexico (Silvestri). There is no doubt that within the next few years they will be found over a still greater area.

My specimens have been collected in either 70 per cent. alcohol or Bouin's picro-formal (the latter for section-cutting), and double staining the whole insect with methylene blue and eosin has given fair results. The abdomen should be pricked with a fine needle to facilitate staining.

Rimsky-Korsakow [14] suggests killing with boiling water or Gilson's fluid, and stains with dilute borax-carmines in 75 per cent. alcohol. Schepotieff used concentrated sublimate solution or Gilson's fluid, and Berlese uses hot acetic acid to produce extension of the mouth-parts and genitalia. The other writers, following an unfortunate custom among many entomologists, give no particulars of their methods.

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The John Innes Horticultural Institution,  
Merton, Surrey: June, 1913.

## BUTTERFLIES NEAR VENICE.

By GERARD H. GURNEY, F.E.S.

THE following is a list of butterflies which I took on the Lido, near Venice, on September 3rd of last year. It is necessarily short; but may be of interest as showing that even in so unlikely a locality as those lagoon-girt swamps a variety of species are common. The "Lido" is the name given to the long strip of land formed by those islands which extends along the mouth of the lagoon, and forms the outer bulwark of Venice against the Adriatic: it is seven miles in length and, roughly

speaking, half a mile in breadth, and is well described by the poet Symonds as:—

“A tract of land swept by the salt sea-foam,  
Fringed with acacia flowers and billowy-deep  
In meadow-grasses, where tall poppies sleep,  
And bees athirst for wilding honey roam.”

Recently, much of the land has been cultivated, numerous villas and hotels built, while charming pergolas covered with vines and roses run each side of the road. Innumerable visitors and tourists come over daily from Venice in the different steamers which every half hour cross in twenty minutes from the mainland; the people come for the sea bathing for which the Lido is justly famous, and it was on my first visit to the shore for that purpose that I saw numerous butterflies, which resulted in my paying several more visits, during which I was able to devote my time to insects instead of the bathing.

There is still a good deal of land uncultivated and not yet built over on the Lido; rough ground with scattered pine trees, and fields of a few acres in extent on which grew a most luxuriant third crop of hay full of flowers, amongst which clover and a blue flowering lucerne were the commonest. In these places butterflies were numerous, and also on the high rough bank running the whole length of the shore; this bank is very wide and is covered with brambles, small acacia trees, and poplars, and on each side long grass and flowers with open patches of ground, quite a good place for insects.

At the far end of the Lido is still a good deal of wood and virgin ground, but this I was not able to visit, otherwise I should no doubt have turned up more species than I did. The majority of species seen were generally quite fresh, and were all of them no doubt second and some third broods.

*Erynnis alceæ*. A few were flying in the hay-fields, but they had seen their best days, and I only kept a couple which could be considered worthy of cabinet rank.

*Nisoniades tages*. Quite common and fresh, rather small perhaps, but in no way remarkable.

*Argiades sylvanus*. Plentiful; apparently a third brood recently emerged, as they were all quite fresh.

*Chrysophanus thersamon*. I only took two specimens of this “Copper,” both males and both much worn. They were in the same hay-field flying along one of the numerous little dykes which are dug in all directions to irrigate the land. I think I saw another specimen in a different locality, but it was blown away before I could secure it. I presume the two specimens I took were examples of a second brood. *C. thersamon* was common near Budapest on May 23th, and I found it then quite fresh.

*C. phlæas* var. *eleus*. One specimen caught, the only one seen.

*Nomiades semiargus*. A few seen of this species on the flowers



by the side of the tram-lines, covered with dust and looking generally very dissipated!

*Polyommatus icarus*. Very common and quite fresh, a fine large form, the females brown with no blue at all; several ab. *icarinus*.

*P. astrarche*. Only one or two seen: they were not very brightly coloured examples.

*Everes argiades*. I found a few specimens of this species in one hay-field. They were rather small and all of them worn.

*Lampides telicanus*. A very abundant species everywhere on the Lido, but its headquarters appeared to be the long bank running the whole length of the sea-shore; I saw a specimen fly across the Grand Canal in the middle of Venice, and it was common in the public gardens at the end of the town. Specimens varied a good deal in size, but on the whole were rather large, and in the series I took, nearly all are notably larger than those which I have from Egypt. The females have fine black borders to the wings. The species was generally fresh, though it was difficult to get perfect specimens, quite two-thirds of those caught having to be released as they were too torn to keep.

*Pieris brassicæ*. Freshly emerged specimens of *brassicæ* were flying about, with enormous females; full-fed larvæ of this species were also seen.

*P. rapæ*. Common and fresh, the form was in no way remarkable.

*Pontia daplidice*. Very frequently seen on the shore, settling on the flowers of the sea-aster; the females laying on various Crucifers growing out of the sand, but well beyond the reach of the tide.

*Colias hyale*. Fairly common.

*C. edusa*. Very common, and var. *helice* frequent.

*Issoria lathonia*. A single rather worn male was caught close to the Excelsior Hotel.

*Melitæa didyma*. This species was very common and extremely fine. The males of a rich brown-red colour, the females large and of only a slightly deeper colour than the males; they were generally in good condition.

*Pyrameis cardui*. Exquisitely fresh *cardui* flew about nearly everywhere on the Lido.

*Vanessa io*. I am not quite sure that I identified this species; a large black looking butterfly flew over me one day when I was in a gondola, and I think it must have been *io*, but I did not see any others.

*Pararge megæra*. Fine, richly coloured specimens were common.

*Epinephile ianira* var. *hispulla*. Fairly numerous on the lucerne flowers, which proved so attractive to *telicanus*; both this and the preceding species were quite fresh.

*Cæonympha pamphilus*. Common, and in good condition.

Keswick Hall, Norwich.

## TWO NEW SPECIES OF THE GENUS *ISCHNURA* (ODONATA) FROM NORTH INDIA.

By F. F. LAIDLAW, M.A.

THE specimens described below were sent to me for examination amongst a small collection of dragonflies from the N.W. and Central Provinces of India by Dr. A. D. Imms, of the Indian Forest Research Institute at Dehra Dun.

They present several features of interest, and belong to two species which do not appear to have been described previously.

### *Ischnura gangetica*, sp. nov.

Two males Sat Tal Kumaon 12.5:12 (fully mature).

Three males Shamket Kumaon 16.12:12 (two males imperfect, fully mature; one male not quite mature).

Length of abdomen, male 24 mm., of hind wing 15 mm.

Build of *I. senegalensis*, but a trifle more robust.

*Venation.* Postnodals on fore wing eight, exceptionally seven or nine. Arculus on fore wing placed well beyond the level of the second antenodal (but in one instance, on the left side, it lies before the level of this nerve). Pterostigma of fore wing black with milky white front border, its fore margin shorter than the hinder; its antero-posterior diameter greater than its length from within outwards. Its hinder margin is strongly convex, and covers about three-quarters of the subjacent cell. Pterostigma of hind wing pale grey in colour, much smaller, oblique, its inner and outer margins nearly parallel, covering barely half of the subjacent cell.



*Ischnura gangetica*,  
sp. nov.

*Head.* Under surfaces yellowish-white, anterior surface green, including the first joint of the antennæ; there is a fine black line at the base of the upper lip, and the nasus is black. The upper surface and distal joints of the antennæ are black, with a round green (or blue?) postocular spot.

*Prothorax.* This is black above, with a green margin in front, and pear-shaped lateral green mark on either side, and a very fine, green edge to the posterior margin. When looked at from above, this margin is seen to have a small, medium, angular projection, but there is no marked prominence.

*Thorax* black dorsally, green at the sides, yellowish-white below; with a fine, complete, green antehumeral band on either side.

*Abdomen* black above, the anterior segments blue-green at the sides and below; in the hinder segments the ventral colour develops an orange tone. Segments eight and nine entirely blue; ten black above, blue ventrally. The articular rings are black, and the black dorsal band on each segment, after the first and second, is contracted at the very beginning of each segment, dilates, and then contracts again abruptly at its extreme hind end.

*Legs* yellowish-green; femora with a broad, longitudinal, dorsal

band of black, tibiae with a similar but narrower band extending along the proximal two-thirds. Spines and tarsal articulations black.

*Anal appendages.* Upper part black, with a square yellowish-white patch on each of their opposed surface. Lower pair yellowish-white, the apex black. Seen in profile the upper pair are stout, slightly bowed downwards, truncate, with their posterior margin concave, the upper end of this margin a little hooked; the lower pair appear conical, tapering to an incurved apex.

When looked at from behind the upper pair are divaricated, the white mark on each is conspicuous, while each has a very strong downwardly directed spur near its base on its inner side; round this spur, which is not seen in profile, the apex of the lower appendage is hooked from without inwards on either side. The tubercles at the apex of segment ten are perfectly white, very small but, on account of their colour, rather striking in appearance.

The colouring is described from the least mature of the males, which is much more vividly marked than are the older specimens. These differ chiefly in having the green of the head, thorax, and prothorax less brilliant, and in having lost the white colour of the small apical tubercles of segment ten. On the other hand, the whitish patch on the upper anal appendages retain distinctness.

The species may be defined shortly as an *Ischnura* with segments eight and nine wholly blue, and ten blue with black dorsum. Tubercles on ten very small. Colour green for the most part, with black markings. Pterostigmata of fore wings of male considerably larger than those of hind wings, their colouring black, with upper part white, not covering an entire cell; pterostigmata of hind wings grey. Posterior margin of prothorax not forming definite lobes. Anal appendages with conspicuous white patch on opposed surfaces of upper pair; these have also a large downwardly directed spur.

*Ischnura immsi*, sp. nov.

One male Sonder Bhandara, Central Provinces 8. 12: 1912.

Length of abdomen 17 mm.; of hind wing 11 mm.

Build of an *Agriocnemis*.

*Venation.* Postnodals on fore wing seven. Arculus at level of second antenodal; anal vein separating from the hind margin a considerable distance before the level of the cubito-anal cross vein, and at the level of the first antenodal. Upper side of quadrangle of fore wing quarter the length of its lower border, in hind wing about half. Pterostigmata of all wings grey, about equal in size, the outer border very oblique; covering two-thirds of the subjacent cell.



*Ischnura immsi*,  
sp. nov.

*Colouring* blue with black marking.

*Head.* Under surface white. Anterior surface blue, including first and second joints of the antennae, but the nasus black; upper surface velvety black, a linear postocular mark on either side, blue, meeting its fellow in the middle line.

*Prothorax* black, fore margin blue, blue marks on each lateral border, hind margin not lobed, with a fine blue edge.

*Thorax* black dorsally as far as the first lateral suture, with a pair of blue antehumeral bands, which are rather broad; sides blue, under surface pale.

*Abdomen* blue; segments one to seven with a black dorsal longitudinal band and black articulations, eight, nine and ten entirely blue. The black band on three to six is narrow for the greater part of its length; at its posterior sixth it widens slightly, so as to form a diamond-shaped mark, narrowing again to join the black articular ring. Tubercles of ten rather prominent.

*Legs* white, small; femora with a narrow black band posteriorly, spines black.

*Anal appendages.* Upper pair black; lower pair white, their apex with a fine black point. In profile the upper pair are blunt and curved downwards; the lower pair are a little longer, conical, directed upwards. When looked at directly from behind their appearance is as shown in the text-figure. Above them lies the square hollow projection formed by the tubercles of segment ten. The upper appendages show as a pair of crescentic structures, their concavities lying to their inner sides. That part of the appendage which is visible in profile is here seen as a small projection directed backwards, rising from the margin of each of the upper pair. The lower pair have each a small dark apical projection approximated to the lower margin of the upper pair, though extending backward beyond them, and to be seen in profile.

The species may be characterized briefly as follows:—

A very small *Ischnura*, with feebly petiolated wings; the pterostigmata of all four wings similar and unicolorous. Posterior margin of prothorax not lobed. Colouring blue with black marks, segments eight, nine, and ten entirely blue; postocular spots linear, confluent.

The smaller of these two species, *I. immsi*, approaches *Agriocnemis* very closely in the characters of its venation, the small extent of the petiolation of the wing being very marked. On the other hand, whilst the arculus lies in line with the second antenodal nerve in this species, in *I. gangetica* it usually lies beyond the level of that nerve (though it is apparently somewhat variable in position; and in this respect *I. gangetica* also approximates to *Agriocnemis*). It is worthy of remark that in *I. gangetica* the strong downwardly directed spur of the superior anal appendage recalls strongly that found in many species of *Agriocnemis*. The whitish patches occurring on these appendages are possibly "recognition marks." When the appendages are divaricated, these marks may be conspicuous in the living insect. One of the specimens has died with the appendages in this position. Compare Tillyard's note on the male of *Hemiphysalis mirabilis*, de Selys, and his remarks on the position of *Ischnura* and *Agriocnemis* amongst the Agrioninae (Proc. Linn. Soc. N.S. Wales, 1912, vol. xxxvii. pp. 443-464).

The type specimens will be returned to the Indian Forest Research Institute.

Uffculme, Devon, July, 1913.



DESCRIPTIONS OF THREE NEW SPECIES OF *LEMA*,  
BY THE LATE MR. M. JACOBY, AND OF A  
FEW OTHER NEW SPECIES OF CRIOCERINI.

By F. W. BOWDITCH.

AMONG the papers of the late Mr. Jacoby I find descriptions of three new forms of *Lema* which he had prepared for publication, and which I now have the pleasure of presenting. The types of all three of Mr. Jacoby's species are in the British Museum; while, through the courtesy of Mr. Gahan, co-types are in my collection.

*Lema sheppardi*, Jac.

Narrow and elongate, black, vertex of head dark fulvous, thorax somewhat elongate, purplish-black, strongly punctured anteriorly and with two deep rows of punctures, elytra fulvous, with deep, round and closely arranged punctures, the interstices at the apex, strongly and acutely costate. Length 8 mm.

Head deeply constricted behind, eyes very large and prominent, deeply notched, interocular space obscure fulvous, clothed with short golden pubescence, the lateral grooves very deep, frontal tubercles broad, distinctly raised, labrum black, antennæ extending to the middle of the elytra, black, the third and fourth joint equal, small, the following joints much longer, slightly flattened and nearly equal; thorax slightly longer than broad, deeply constricted near the base, the lateral excavation bounded at the sides by a perpendicular ridge, the anterior portion widened, their angles forming a slight tubercle, the disc with a shallow transverse sulcus at the sides which does not extend to the middle, the latter with two longitudinal rows of deep punctures; other equally deep punctures are placed near the anterior angles, scutellum black; elytra with ten rows of large and deep punctures and another short row near the scutellum, dark fulvous, the interstices strongly costate near the apex, where the punctures are smaller and more closely placed; under side and legs black.

*Habitat*.—Beira, E. Africa (P. A. Sheppard).

This is one of the narrowly elongate species of *Lema* allied to *L. longula*, Quedenf. and probably *L. Mechowi*, Weise, well distinguished by the shape and structure of the thorax and its strong punctuation; also by the colour and pubescence of the head. I received two specimens from Mr. Sheppard.

*Lema beiraensis*, Jac.

Fulvous, antennæ (the basal two joints excepted) and the tibiae and tarsi black, thorax widened anteriorly, minutely punctured at the middle, elytra strongly punctate, striate, with a deep basal depression, each elytron with a longitudinal black band from the shoulder to below the middle and strongly narrowed at the base. Length 5 mm.

Head impunctate, fulvous, frontal elevations highly raised, joined in front but deeply divided behind, lateral grooves deep, finely pubescent, labrum and palpi fulvous, antennæ black, the lower two joints and the base of the following two joints fulvous, third and fourth equal; thorax not longer than broad, the anterior portion rather strongly widened, the sides deeply constricted near the base, the cavity bounded above by a short perpendicular ridge, the basal sulcus very deep, the middle of the disc with some few punctures arranged in rows, all the rest of the surface impunctate, scutellum truncate at the apex; elytra with a rather deep depression below the base, strongly punctate-striate, the ninth row of punctures entire, fulvous, each elytron with a posteriorly strongly widened black band which does not quite extend to the apex; this band is rather suddenly obliquely narrowed anteriorly and extends to the shoulders in a narrow stripe; under-side and legs fulvous, the tibiæ (the base excepted) and the tarsi black.

*Habitat.*—Beira (P. A. Sheppard).

A well-marked species, of which three specimens are before me. The shape of the elytral dark bands obliquely narrow at the base, so as to separate the fulvous portion at the base into a somewhat elongate triangular space, below which only the sutural and lateral margins remain narrowly fulvous, which colour is again widened at the apex. *L. atrofasciata*, Jac., is of somewhat similar coloration but has differently coloured legs, and the elytral band is of nearly equal width and slightly narrowed at the middle; the labrum and sides of the breast are black, &c.

*Lema fulgentula*, Jac.

Fulvous, the breast, the posterior femora at the apex and the tarsi more or less black, head finely pubescent, impunctate, thorax with deep basal and feeble anterior sulci, impunctate; elytra cylindrical, rather finely punctate-striate, feebly depressed below the base; posterior femora with a minute tooth. Length 4 mm.

Very closely allied to *L. pubifrons*, Jac., and *L. planifrons*, Weise, so that it will be sufficient to point out the differences. From the first-named species the present insect differs in the longer antennæ, which have their terminal joints distinctly widened, in the much more feeble anterior thoracic sulcus, the more cylindrically shaped elytra, and in the much more strongly developed legs and their colour. From *L. planifrons* the species may be known by the entirely impunctate head, the colour of the antennæ, very feeble elytral basal depression, the minutely dentate posterior femora, and the partly fulvous, partly black tarsi; all the other characters are nearly similar.

*Habitat.*—Beira (P. A. Sheppard).

*Lema callangaensis*, nov. sp. (Jac. in litt.).

Elongate, ferruginous, labrum, antennæ (first joint excepted) knees, tibiæ (almost entirely) and tarsi black. Length  $3\frac{1}{2}$ –4 mm.

Type, Callanga, Peru (coll. Bowditch).

Two examples sent by Messrs. Staudinger & Bang Haas with the foregoing manuscript name, and three others among the unnamed Jacoby material apparently from the same place. Exceedingly close to *similis*, Lac., the most obvious difference being the black labrum, the other differences being opinionative; the thorax of *callangaensis* is perhaps a trifle more elongate and less compressed, the punctuation is similar, the elytra of *callangaensis* are a trifle stouter, and the punctuation somewhat stronger; but these differences are slight, and more of degree than anything definite; the black labrum is the same in four of my five examples, and rather dubious in the other.

The above description will serve to draw attention to the two forms until they have further study.

*Lema marcapatensis*, nov. sp. (Jac. in litt.).

Head black, antennæ black, becoming fuscous at tip, thorax rufous, shining, scutellum black, elytra, cyaneous blue or green, with two small dots on the basal margin, a curved fascia behind the middle, the apex broadly and the lateral margin narrowly, yellow; body beneath and part of the first abdominal segment black, remainder of abdomen yellow, feet black with trochanters, and an elongate spot on the underside of the femora yellow, tarsi fuscous. Length  $6\frac{1}{2}$  mm.

Type, Marcapata, Peru (coll. Bowditch).

Head with usual frontal puncture, transversely depressed behind the vertex, the extreme neck rufous, thorax rather strongly constricted and depressed behind, shining, impunctate, elytra with humeral and basal depressions fairly well marked, the elytral punctures becoming obsolete behind, and the intervals correspondingly costiform; the fulvous band is placed behind the middle, and narrow, of equal width and convex in front, the front edge attaining the middle of the elytra; the anterior edges of the apical yellow spot are slightly oblique or almost straight, the small yellow dot at the base is doubtless often absent, and probably the middle band varies a good deal; beneath, the black colour of the body is extended into the first segment of the abdomen by a lunate spot on each side, occupying about half the space; the elongate femoral spots are particularly well developed on the four posterior legs.

The above description is made on the basis of the elytra being cyaneous with yellow bands, but it could equally well be termed yellow with cyaneous markings.

Distributed by Messrs. Staudinger & Bang Haas with the above manuscript name; very close to *violaceo-marginata*, Clark.

*Lema rufocincta*, nov. sp.

Violaceous, with head, thorax, femora, body beneath, and elytral margins (except part of the suture) yellow, antennæ (except the first joint), tibiæ, and tarsi black. Length 8 mm.

Type, one example, Playa Vicente, Mexico (coll. Bowditch).

Head with smooth, polished vertex, and deep side grooves, not



constricted behind, antennæ not quite reaching the middle of the elytra, the first joint rufous, second short, third shorter than fourth; pubescent from first to end, which is slightly fuscous, thorax smooth polished, rather strongly constricted behind the middle, a few very fine punctures at the anterior angles, which are obsolete; also two fairly regular rows on the disk (with scattered ones between), but all very fine and obsolete after the middle; scutel fulvous, elytra shining violet, the punctures arranged in striæ but not impressed, and obsolete behind, where the striæ become plainer, sides parallel, a deep intrahumeral impression and a well-marked transverse impression below the base (where, as usual, the punctures are the largest), the margin thickened at the sides, the yellow colour is confined at the sides to this margin; it suffuses the tip and is again visible in the scutellar region, but does not extend below the basal depression. It shows, also, very narrowly at base where it connects with the lateral margin.

My example bears five labels: "Playa Vicente," "Mexico Salte coll.," "12," "n.i.m.," "Jac. 2nd coll." It was unnamed in the Jacoby material. It seems to come near *peruana*, Jac. (type in my coll.).

*Lema balsas*, nov. sp.

Rufous, elytra dark shining, cœrulean blue, antennæ except the basal joints, the posterior legs wholly, and the four anterior tarsi wholly, and tibiæ partly, black, body beneath, except the thorax, dark shining, almost impunctate blue-black. Length 8 mm.

Type, one example, Rio Balsas, Guerrero, Mexico (Wickham) (coll. Bowditch).

Head with clypeus swollen, nearly smooth, with a deep foveate puncture in the middle; head not constricted behind the eyes, vertex swollen, transversely strigose with a deep foveate depression in the centre, antennæ with four basal joints, smooth, first two rufous, three and four equal, rufous blackish, remainder black pubescent, not reaching the middle of the elytra; thorax rather short, anterior angles (viewed from above) rather prominent, coarsely, moderately punctate; also a median row of finer punctures three or four wide, beginning at the anterior margin and running down the middle of the disk, and gradually tapering off to a deep fovea in the transverse depression at the rear; sides deeply coarctate a little behind the middle, the extreme base narrowly margined, scutel rufous, slightly blackened; elytra stout, parallel, finely punctate in regular striæ (only the sutural being impressed), a well-marked short intrahumeral impression and a deep, transverse basal depression (foveate) and a large lateral, foveate puncture on the edge below the shoulder; the four anterior tibiæ are rufous below, shading into black above, the mesosternum punctured anteriorly.

I place it near *chalybeipennis*, Lac.

*Lema wickhami*, nov. sp.

Rufous, elytra chalybeate blue, lower part of face, antennæ and legs black. Length 5 mm.



Type, one example, Chihuahua, Mexico (Wickham) (coll. Bowditch).

Front with a few fine punctures and a small frontal fovea, neck slightly constricted behind the eyes, thorax tubular, moderately constricted near the base, a few very fine punctures near the front, scutellum rufous; elytra deeply, coarsely quadrate punctate, arranged in regular striae, the punctures becoming smaller behind, where the intervals become costulate; the femora are rather swollen and then suddenly constricted near the end; allied to the small similarly coloured forms like *amabilis*, Jac., but easily distinguished from all by the black legs and antennae, with entirely rufous body.

*Crioceris chiriquensis*, nov. sp. (Jac. in litt.).

Uniformly bright metallic green, with labrum and joints 5-11 of antennae, blue-black and dull, underside more or less bluish; elytra finely and nearly regularly punctulate striate, the entire surface minutely alutaceous, and with irregular fine wrinkles, giving a semi-dull appearance. Length 11 mm.

Type Chiriqui, eight examples (coll. Bowditch).

Size and form of *nullicedo*, Lac., and its allies; head with a deep longitudinal groove in the vertex, with fine punctures on either side, surface alutaceous, joints three and four of antennae equal, the latter reaching beyond the middle of the body, thorax strongly constricted at middle, vaguely quadrifoveate on the disk (the foveae placed in a square), the surface alutaceous, and finely punctate and obsoletely strigose near the anterior angles and along the sides; elytra nearly parallel, faintly punctulate striate, almost obsolete in places in some specimens, a faint lateral impression slightly one side of the middle, similar to *nullicedo*, Lac., and its allies; as compared with *nullicedo*, the surface of *chiriquensis* is more distinctly alutaceous and wrinkled; there is no trace of any transverse coloured band; the curving of the tibiae is about the same in both; there are other minor differences of punctuation; *nitida*, Lac., has a sparsely but distinctly punctate thorax.

*Crioceris tumida*, nov. sp.

Head rufous, elongate, clypeus swollen, sparingly punctured and pubescent, antennae with first 4 joints short, 3 and 4 equal, remainder broadened (slightly more so at tip) and closely articulated, vertex punctate, deeply grooved, neck strongly constricted; thorax rufous yellow, elongate, faintly transversely depressed near base, strongly compressed laterally a trifle behind the middle, with a double line of very fine punctures down the middle, vanishing behind in a vague depression, and with a faintly marked fovea in either side before the middle; scutellum hairy; elytra much wider than the thorax, squarely truncate, with the scutellar region raised into a peaked hump; general colour yellow, with a more or less interrupted rufous band behind the middle, and the apex and shoulders also indefinitely rufous, the surface polished and shining, as if varnished, with a few scattered deep foveate punctures between the shoulders and scutellar region; only one or two on the hump, which is limited behind by a

rather regular row, the deepest of all, a few along the lateral margin and ante-apical region, the rufous colouring being as a rule exempt from foveæ; beneath the glaze of colour can be easily seen regular rows of fine punctures, vanishing behind, body beneath rufous more or less pubescent. Length 8 mm.

Type, two examples, N. Luzon (5-6000 ft.), Whitehead leg., among the *Tring* material.

Most nearly related to *gibba*, Baly, and differing as follows: Joints 5, 6, 7 of the antennæ are proportionately much longer in *gibba*, the double line of punctures on the thorax is much better defined in *gibba*, the thorax in *gibba* is more elongate, and viewed from above shows a well-marked anterior angle, which is very faint, almost lacking in *tumida* where the sides are almost completely rounded; the elytral punctuation, as shown under the glazed surface, is coarse, quadrate, almost confluent in *gibba*, but very fine and distant in *tumida*. The general colour of *gibba* is old mahogany, *tumida* almost yellow. The body beneath in *tumida* is almost wholly dark rufous with abdominal rings edged with lighter colour; femora strongly clavate, with pubescence more or less gathered into rings, tibiæ and body more or less covered with grayish pubescence.

*Crioceris foveipennis*, nov. sp.

Form stout, colour yellow, with smooth black or very dark rufous spots on the elytra; the scutellar region raised into a prominent hump, like *gibba*, Baly.

Head with swollen, punctate, and pubescent clypeus; smooth in front, the vertex deeply sulcate, punctured, pubescent, antennæ short (like *severini*, Jac.), joints 2-4 short, equal, shining, the second with a marked constriction, 5-11 pubescent, gradually broadened to 7, 8, 9, which are wider than long, and darkened, thorax cylindrical, with a well-marked anterior angle and very faint double row of discal punctures, moderately constricted back of the middle towards the base, so as to give the appearance of a wide collar, scutel pubescent; elytra very shining, rather thickly covered with deep foveate punctures, arranged without order, the dark spots of varying size and without any particular order, a prominent post median and rounded apical being the most marked, and scattered patches round the hump and shoulders; as a general rule the foveæ avoid the colour, but when they do occur they form a circle of the ground yellow colour; this tendency to form circles is noticeable at many points where the foveæ approach the dark patches; body beneath, fulvous, with dark spots on the sides and middle of the metasternum and each segment of the abdomen; legs fulvous pubescent, with darker clouds on the femora, knees, and middle of the tibiæ; claws black. Length 8.5 mm.

Type, one example, Belihul-Oya, Ceylon (Kannegieter), formerly part of Mr. Van de Poll's collection (coll. Bowditch).

Belongs to the *gibba*, Baly, group; allied to *dromedarius*,

Baly, by the colour and punctuation of the thorax, and to *severini*, Jac., by the shortened antennæ, which hardly do more than reach the elytra; the scattering of the dark colour patches on the elytra gives the species the most speckled appearance of any of the group.

DESCRIPTION OF A NEW SPECIES OF  
*METEORUS* (BRACONIDÆ).

BY G. T. LYLE, F.E.S.

*Meteorus niger*, sp. nov.

Thorax and abdomen entirely black with the exception of the prosternum (sometimes the whole prothorax), which is flavous. Legs with coxæ flavous, hind tibæ apically darker above, claws black. Head narrower than the thorax, occiput and vertex fuscous, with the orbits flavo-testaceous, face, clypeus, cheeks, mandibles, and palpi flavous. Antennæ filiform, as long as, or slightly longer than, the body, fuscous, lighter beneath, radicle flavous, annellus and base of post-annellus testaceous. Wings hyaline; stigma nigropiceous; nervures piceous, occasionally lighter; recurrent nervure everted (I possess a female in which it is interstitial in the right wing only), second cubital areolet not, or scarcely, narrowed towards the radius. Tracheal grooves distinct; terebra black, rather longer than half the abdomen.

Length, female without terebra,  $4\frac{1}{2}$  to 5 mm., expands  $9\frac{1}{2}$  to 10 mm.; male slightly smaller.

Described from ten males and twenty-eight females.

It should be noted that the terebra is very slightly longer than half the abdomen; the stigma is infuscate throughout; the lower basal nervure is distinctly postfusal; the recurrent nervure is emitted from near base of the second cubital cell; and the radial cell of the hind wing is not germinated by a transverse nerve.

*Meteorus niger* is most closely allied to *M. melanostictus*, Capron, but differs therefrom principally in that the recurrent nervure is not continuous with the first intercubital; the mesosternum and metasternum are never testaceous; the terebra is at least as long as half the abdomen; the wings are hyaline; the postbrachial cell is shorter when compared with the præbrachial; and the insect is smaller.

This species (already referred to by me—but not described—in Entom. vol. xiv. p. 128) exhibits astonishingly little variation and is easily distinguished from its near relatives. In the New Forest it is a common solitary parasite of the larva of *Hygrochroa* (*Pericallia*) *syringaria*, from which host I have bred it in some numbers every year since 1903. Mr. Claude Morley informs me that he has received it from Mr. E. R. Buckell, who bred it from



New Forest specimens of the same host. Oviposition takes place in the autumn, and soon after the host larva starts feeding in the spring the parasite larva emerges. It spins a cocoon which is pendulous (suspended by a fine swing rope generally some 10 or 12 mm. in length), brown, shining and brighter in colour than those of *M. pulchricornis*, Wesm., *M. melanostictus*, and *M. scutellator*, Nees. The imago appears some fortnight or so later, and has occurred to me from April 4th to May 20th. So far this parasite has not been bred from any other hosts, though, undoubtedly, it is not confined to *H. syringaria*.\*

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In connection with the above I venture to transcribe a very interesting letter I received respecting the same host and parasite on June 5th, 1911.—CLAUDE MORLEY.

I found some larvæ of *H. syringaria* in the New Forest in late March; I got in all thirty larvæ; they grew a little until the first week in April, and then each larva, before attaining its full growth, hung itself to the food-plant or to the roof of the breeding-cage by a thread of between two and four inches. The body was kept doubled up. The next day a larva so suspended was found to have a pupa-case of an ichneumon suspended from it. The larva was then practically dead and quite unable to feed, and had become very shrunken. They subsequently died from these ichneumons, whose pupæ were suspended by some two to eight inches of thread, which was coarser than that by which the larva had suspended itself. The upper end of the parasitic pupa-case was dark, and in the lower part, after about a fortnight, one could see the body of the ichneumon. The fly emerged by cutting off a circular cap from the lower end of the pupa-case, or in a few cases by eating a rather irregular hole through the side of the case. The darkest specimens, the males, all came out first; and then the rather softer-bodied females, which had a yellowish patch in the centre of the dorsal surface of the abdomen. Out of the thirty New Forest larvæ, not one was free from an ichneumon, and in no case did more than one come out of each larva, and they all acted in the same manner. Four larvæ found ten miles from the New Forest were unattacked, and the imagos have come out.—E. R. BUCKELL; Gonville & Caius College, Cambridge.

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## NOTES AND OBSERVATIONS.

DELAYED DEVELOPMENT OF WINGS IN LITHOSTEGE GRISEATA.—Delayed development of the wings has been noticed in various species of Lepidoptera. Blenkarn wrote a note on it in the case of *Chesias rufata* (*obliquaria*) and *C. spartiata* (Proc. South London Ent. and Nat. Hist. Soc., March 23rd, 1911). A delay of ten hours was

\* [I have examined Mr. Lyle's types of both sexes, and feel no doubt respecting the novelty of the species.—C. M.]



observed, but on removal from a damp to a dry cage rapid expansion took place. I have myself noticed a delay of ten or twelve hours in *Chesias rufata*. This year I bred eleven *Lithostege griseata*; of these three never showed any signs of expansion, two expanded partially, and six completely. Most of them emerged about six p.m., and one evening I was fortunate in seeing two run up out of the moss, and at once transferred them both to dry breeding-cages. One showed no sign of expansion till twenty-four hours after emergence, and then its wings grew rapidly and completely; the other did not begin to expand until sixty-six hours after emergence, and then its growth was not quite complete. Under certain conditions these allied species of Geometers show a tendency to delay in the expansion of their wings, and if this occurs under natural conditions it must add greatly to their risks of death before propagating their kind. Mine all emerged in a damp box, in which some were left, but others were transferred to dry cages as soon as observed; but absence of development and perfect development appeared to take place in either case. The numbers bred were too few to draw any conclusions as to the cause of the phenomenon. I should like to know if a delay of sixty-six hours has ever been noticed before.—E. A. COCKAYNE; 16, Cambridge Square.

*THERA VARIATA* AND *OBELISCATA* BRED FROM SPRUCE.—During a short visit to Brockenhurst early in April of this year I succeeded in repeating my experience of last season, as recorded by Mr. L. B. Prout in his article on *Thera variata* (Entom. vol. xlv. pp. 241–246). I obtained from the same row of spruces some thirty *Thera* larvæ in various stages of growth. The larvæ were much scarcer than on my previous visit, and nearly all of those secured proved to be ichneumonised. They were fed entirely on spruce, and in May began to emerge. The first two were typical *obeliscata*, both large females of a red-brown shade, quite indistinguishable from other south-country specimens in my series. Three days later, on May 6th, a pair of true *variata*, exactly resembling those bred by me last year, and the pair figured by Mr. Prout, emerged. Unfortunately, I failed to secure a pairing. These were followed on the 12th by a female *obeliscata*—a pale form with a narrow dark bar—and on the 18th by a female *variata*, exactly similar to the earlier specimen. Since then nothing else but ichneumons have arrived; but the evidence of these six, all obtained from the same row of spruce trees and bred under the same conditions, seems to prove clearly that the variation does not depend merely upon difference of food-plant. I had hoped to be able to cross the two forms, and the result of such a cross would be of considerable biological importance, but my material this season has been insufficient, and I can only trust that other entomologists with greater skill and fuller opportunities will try the experiment, which should not be a difficult one. — (Rev.) C. E. RAVEN; 4, Park Terrace, Cambridge.

*ÆGERIA* (*SESIA*) *SCOLIÆFORMIS* IN STAFFS.—It may be of interest to record that at the end of May I succeeded in extracting from a birch-trunk on Cannock Chase, Staffordshire, a pupa of *Æ. scolice-*

*formis*, which emerged on June 21st. Visiting the same locality again to-day, I was fortunate enough to take a fine female, flying round a tree-trunk in the afternoon sunshine, doubtless in search of a suitable place to deposit ova. I do not know whether the insect has been recorded from this locality before, but without doubt a considerable colony is established there. I had previously found empty pupa-cases which I had supposed to be this species, but as they are rather small compared with the older Welsh specimens I have seen in collections, I could not feel certain that they were not merely *Æ. culiciformis*.—H. C. HAYWARD; The Croft, Repton, July 1st, 1913.

PAPILIO XUTHUS AT WOKING.—The occurrence of a living specimen of an exotic butterfly in this country is always of sufficient interest to be placed on record, even if no satisfactory explanation of its appearance can be offered. On May 27th, at about 4.15 p.m., Miss Eleanor Balfour noticed a strange butterfly hovering over some bushes of *Skimmia japonica* in the garden at Fisher's Hill, Woking. She netted the specimen, and, recognizing that it differed materially from our only native "swallow-tail" (*P. machaon*), sent it to me for inspection. It was obviously a stranger to this country, and a reference to the British Museum Collection enabled Sir George Hampson to identify the insect as *Papilio xuthus*, a native of China, Japan, and Corea. I am quite at a loss to account for its presence here; it must, of course, have been imported, but how?—as larva, pupa, or imago? There are no conservatories about the premises where directly imported exotic plants are cultivated, and such foreign shrubs, &c., as are grown in the garden are procured in the usual way through nurserymen. So far as concerns sealy covering, the wings are in good condition, but large notched pieces are symmetrically jagged out of the hind wings, thus suggesting that the butterfly had emerged from the pupa here, and had been attacked by some bird (?) as a stranger. At any rate, apart from the mutilation referred to, the condition of the wings is such that the specimen cannot be regarded as a casual immigrant in the ordinary sense. I am quite ignorant of the life-history of this species; perhaps some entomologist who is familiar with its history may be able to make some more definite suggestion as to the possible mode of introduction of this exotic—I vouch only for its capture as a living specimen.—RAPHAEL MELDOLA; 6, Brunswick Square, W.C., July 11th, 1913.

ARASCHNIA LEVANA AT CARDIFF.—Whilst out yesterday in search of *Brenthis euphrosyne*, I caught a good specimen of *Araschnia levana* (as described by Kirby), and was naturally surprised to find it near this locality. I could not find this fritillary mentioned in 'Butterflies of the British Isles,' and consequently conclude it is not a recognized British species; I should therefore be glad to hear whether this is so.—T. BUTT EKINS; Cardiff, May 29th, 1913.

SCARCE SYMPETRA (ODONATA).—On looking through a box of dragonflies taken by Mr. C. B. Williams, I was pleased to find a specimen of *Sympetrum fonscolombii*, male, and another of *S. flaveolum*, male. The former was taken on August 12th, 1911, at Merton,

Surrey, while the latter was taken in the same year, and, Mr. Williams thinks, on the same day. It is generally supposed that these species are both migrants to Britain, and there appears to have been in 1911 a considerable flight of the former to our islands.—W. J. LUCAS; Kingston-on-Thames.

COLIAS EDUSA AND PYRAMEIS ATALANTA IN SURREY.—On June 15th, at Ranmore, I took a male *Colias edusa*, a fine large specimen in good condition. My friend Mr. B. S. Williams took a very worn and, as it laid no ova, apparently spent female. Two others were also seen. On June 12th a *Pyrameis atalanta* was seen in the garden at Dulwich.—F. H. STALLMAN; "Braemar," 58, Thurlow Park Road, West Dulwich, S.E.

CHÆROCAMPA ELPENOR, ab.—I have to-day had an "elephant hawk-moth" hatch out, which I think is rather interesting. The left side is quite normal but for two white spots on the costal margin of the fore wing towards the apex. The right fore wing is a much paler olive-green than the left, and the pinkish suffusions are replaced by pale lilac, and there is partly a third band of this colour across the base of the wing. The pink markings on the right side of the thorax are partly replaced by the same shade of lilac. The hind wings are quite normal.—ARTHUR MINTON; 9, Park Road, Bexhill, June 15th, 1913.

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### RECENT LITERATURE.

1. *Annals of Tropical Medicine and Parasitology*. Series T. M. Vol. vii. No. 1. March 31st, 1913. Liverpool.—This part contains a lengthy, well-illustrated article on "Contributions to the Study of Colour Marking and other Variable Characters of Anophelinæ, with Special Reference to the Systematic and Phylogenetic Grouping of Species," by Major S. R. Christophers. Besides this the references to entomology are of a most general nature in connection with disease-carrying Diptera.

2. We have from E. Leitz (18, Bloomsbury Square) a copy of an illustrated pamphlet (38 pp.)—*Guide to Photomicrography*—primarily prepared for users of apparatus made by this firm. Anyone interested in this subject should obtain a copy. Another pamphlet of a similar character is *Directions for the Use of the Large Metallurgical Microscope with the Camera*.

3. *Review of Applied Entomology* (Series A, Agricultural, and Series B, Medical and Veterinary), issued monthly by the Imperial Bureau of Entomology (Dulau & Co., London), is intended to keep its readers up to date by giving abstracts, &c., of publications connected with these subjects.

W. J. LUCAS.

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## LIFE-HISTORY OF *ARGYNNIS HECATE*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

MR. K. PREDOTA, 'Verhandlungen und Mitteilungen des Siebenbürg. Vereins für Naturwissenschaften,' vol. lxii. p. 4, 1912, states that he observed females of this butterfly selecting plants of the Dropwort (*Spiræa filipendula*), and then depositing their eggs in the ground round their roots, but he failed to find the eggs.

The Hon. N. Charles Rothschild and Miss Charlottée de Wertheimstein, who observed the butterfly both at Peszér and at Cséhtelek, in Hungary, tell me that it only occurs where the *Spiræa filipendula* grows, and in those spots in the Peszér Wood where the plant is absent *Argynnis hecate* is not to be found.

As this insect probably deposits only one or two eggs on a plant in a state of nature, it is not surprising that the above-mentioned observers failed to find the egg. It may further be remarked that, as this species hibernates in the egg-stage, this position is remarkably secure, as neither mowing the meadows nor grazing them with cattle can injure the egg of this butterfly either during the summer or the autumn.

On June 10th, 1912, I had the pleasure of receiving from the Hon. N. Charles Rothschild four living females of *Argynnis hecate*; these I immediately fed with sugar and water, and placed them on plants of *Spiræa filipendula*, covered with gauze netting. During the remaining three weeks a large number of eggs were deposited; nearly all were laid on the base of the stems of the plants, in many cases as low down as the butterfly could possibly reach with the ovipositor, viz., below the surface where the soil separated from the stems, forming a small narrow fissure, while some were laid in and upon the soil itself close to the stems. Several of the eggs were kept on the plants as laid out of doors throughout the whole period of the egg-state, from June, 1912, to March 7th, 1913; others were removed in February from the plants (the stems cut up with eggs attached) and brought indoors; and some were kept indoors throughout the winter near a window facing north-west. All three lots started hatching on March 7th, 1913.



The egg measures .79 mm. high and 1.06 mm. in diameter at the base; it is of a pointed conical shape. Of several specimens examined, each had nine very prominent keels, six running the entire length and rising high above the crown, the three remaining keels originate much lower down, being two-thirds the length of the others; all are transversely ribbed by about fourteen in number, these extend across the intervening spaces of the shell, which is granular. The micropyle is sunken, the keels standing high around it.

When first laid, it is primrose-yellow in colour, which gradually deepens to coppery-reddish, then to a warm lilac-brown, and the keels pearl-grey with an ochreous tinge in shadow. They remain thus coloured throughout hibernation and until hatching.

The young larva directly after hatching is rather large in proportion to the butterfly, measuring 1.33 mm. long. In structure it exactly resembles that of *A. laodice*, with the exception that on the lateral lobe of each segment *hecate* has only four hairs, while *laodice* has five, and the ground colour is a deeper olive-ochreous; the head is shining olive-black beset with fine pectinated whitish bristles; on the first segment is a transverse chitineous shining olive-brown disc. The dorsal surface of the anterior half of the body is darker than the rest. The surface is granular and densely sprinkled with dusky points. In other details of structure it is similar to *laodice*. The globose warts turn olive-brown when a day old.

Owing to the continuous dull, chilly weather throughout the greater part of March and April, the larvæ remained in a sluggish condition, feeding only at intervals, which proved fatal to a large number. The survivors remained fully six weeks in the first stage.

The first moult occurred on April 25th, 1913. After first moult (shortly before second) it is 4.75 mm. long; the head is shining black beset with bristles. The ground colour of the body is pale ochreous checkered with purplish-brown, and a medio-dorsal and subdorsal line of the same colour. There are six longitudinal rows of blackish tubercles, each beset with a number of finely pectinated bristles, the base of each tubercle is pale amber blending into creamy-whitish, forming a series of pale square spots. The legs purplish and claspers olive.

After second moult the ground colour is pearly-grey white, checkered and speckled with purplish-brown; the tubercles cream-coloured with amber bases, and beset with black pectinated bristles. The head shining black mottled with ochreous; legs black, claspers olive-brown and whitish-ochreous.

After third moult it is 12.7 mm. in length. Similar to the previous stage, excepting the markings are more numerous and all clearly defined, also deeper in colour, with a conspicuous

medio-dorsal line and a lateral white stripe. The black head is mottled on the crown with pearl-white, and the clypeus is yellow.

After fourth moult, fully grown, it measures 30.16 mm. long. The head is black mottled with pearl-white and orange, face black, clypeus orange; beset with numerous finely pectinated bristles of various lengths. Body slightly attenuated anteriorly, more so posteriorly; all the tubercles are pearl-white with deep orange-amber bases amply beset with simple black-pointed spines, and small blackish hairs and bristles are scattered over the surface of the body. The segments are divided into four subdivisions, the largest occupying the anterior half, which bear the six tubercles, three on either side, which are dorsal, subdorsal, and subspiracular; the latter situated on a conspicuous yellowish-white lateral stripe. The ground colour is pearly whitish, vermiculated, speckled and checkered with purplish-black; a medio-dorsal longitudinal stripe of the same colour extends the entire length, and terminates at the apex of the anal conical point; it is broken up at the segmental divisions. A series of black bands extend between the dorsal and subdorsal tubercles, one on each segment. The ventral surface is mottled with purplish-brown and roughly granulated.

The first larva became fully grown and ceased feeding on May 24th; it suspended itself on the 25th, and pupated May 27th. The larval existence occupying 111 days.

The pupa measures 18 mm. long. Excepting its smaller size it very closely resembles that of *Argynnis laodice* both in form, colouring, and general structure.

Dorsal view: Head with a pair of lateral angular horns, base of wings with similar angulated points, inner margin with a prominent ridge; body narrowed across the middle, swollen at hind margins, abdomen attenuated.

Lateral view: Head beaked in front, thorax angular and keeled, sunken at metathorax and base of abdomen, the latter strongly curved posteriorly, which terminates in a truncated cremaster furnished with hooks. Ventral surface of abdomen almost straight; wings bulging near apex; antennæ slightly serrated at tip.

The ground colour is pale pinkish-brown, entirely covered with a fine reticulated fibrous pattern, and a dark ashy marginal border to wings and a paler median bar. The abdomen is faintly striped longitudinally with dusky-brown, one stripe enclosing the spiracles, the other is subspiracular. There are two rows of prominent dorsal conical points, those on the thoracic segments and first and second abdominal segments are brilliant silver-gilt; on the fifth, sixth, and seventh segments is a very small medio-dorsal point.

The first one, which pupated on May 27th, produced a fine

male imago on June 17th, the pupal stage occupying twenty-one days.

*A. hecate* partakes of the characters of other Argynnidae in its different stages. The egg mostly resembles *A. adippe*. The larva in the first stage is almost identical with *A. laodice*, and in the last stage closely resembles *A. lathonia* in structure. The pupa is similar to *A. laodice*.

As already stated, the first stage of the larva was abnormally prolonged. This stage should probably last twenty days or less instead of forty-two days, and the emergence of the imago would take place during the first week of June, the usual time of its appearance in Hungary. It is interesting to note that March 7th, the date when the ova hatched, corresponds with the date when spring is considered to supersede winter in the plains of Hungary.

## ORTHOPTERA OF DEVON, WITH NORTH AND EAST CORNWALL.

By W. J. LUCAS, B.A., F.E.S.

MR. C. W. BRACKEN has been good enough to send me a list of the records known to him of Orthoptera that have occurred in Devon and in North and East Cornwall. The publication of this list may not only be of use to those who are working at this order of insects, but it may also be the means of bringing to light other captures in a district that is well calculated to supply them.

### Forficulodea.

*Anisolabis annulipes*.—Taken by Dr. Swale amongst the ashes of a bakehouse in Tavistock. Mr. J. H. Keys of Plymouth has some given him in June, 1894; but the bakehouse is now pulled down.

*Labia minor*.—Said to be abundant in South Devon, but Mr. Bracken does not find it so. It was taken "swarming" over cut grass at Beaumont Park, Plymouth, in 1899, and in Bloye's Infirmary, Week Street, Plymouth, October, 1890 (J. H. K.). Mr. Keys has pointed out its resemblance to the beetle *Lithosia ochracea*.

*Forficula auricularia* is of course common everywhere.

*F. lesnei*.—Sidmouth.

### Blattodea.

*Ectobius lapponicus*.—Exeter. Torquay, August 5th to 16th, 1899; at sugar.

*E. panzeri* (with var. *nigripes*).—Tregantle and Whitsands, fairly often; June 13th, 1891; July 6th, 1897; July and September, 1911 (J. H. K.). Abundant under old bark and

rotten wood on posts adjoining Churston golf links (G. T. Porritt).

*E. perspicillaris* (= *lividus*).—Occurrence somewhat doubtful.

*Blattella germanica*.—Forty young ones bred from one egg-capsule by Keys and Bignell, 1895, taken in a Plymouth restaurant. Probably still found in bakehouses in Plymouth.

*Blatta orientalis* and *Periplaneta americana*.—Common in Plymouth in houses, bakehouses, &c. (C. W. B.).

*Rhyparobia maderæ*.—A specimen taken in Great Western Docks at Plymouth, now in the Athenæum Museum in that town.

### Gryllodea.

*Gryllotalpa gryllotalpa*.—A full-grown male was taken alive on the sandhills at St. Enodoc near St. Minver, North Cornwall, during the week ending December 20th, 1912 (C. W. B.). Near Exeter?

*Gryllus domesticus*.—Wrangaton, September, 1908 (P. de la Garde); considered "general in Devon."

*G. campestris*.—Mr. Bracken does not find it "general in Devon," as it has been stated to be.

### Locustodea.

*Leptophyes punctatissimus*.—Very abundant at Bude, and Woolacombe in North Devon, amongst herbage, brambles, &c., August, 1911, and 1912 (C. W. B.). Saltash, in Priory Garden, common, September, 1912 (C. W. B.). Shaugh Bridge, September 23rd, 1912 (C. W. B.). Common at Churston at sugar (G. T. P.). Torquay, at sugar, August 5th to 16th, 1899. Cann Woods, frequently.

*Meconema thalassinum* (= *varium*).—Torquay, at sugar, August 5th to 16th, 1899. Cann Woods, not common, September 7th, 1913. Shaugh Woods, not common, September 19th, 1912. Common at Saltash, in Priory Garden, September 23rd, 1912. Brampford Speke, September, 1910 (C. W. B.). Found on oak, except in Priory Garden where it was most abundant on bay; there were no limes in the garden, and only one oak, with high lower branches. Common at Churston and taken at sugar (G. T. P.).

*Conocephalus dorsalis*.—Abundant in marshy ground, Broadlands, Churston (G. T. P.).

*Phasgonura viridissima*.—Common generally in Devon and Cornwall. Taken at Mawgan, August, 1910; Loddiswell, 1904; Bovey, 1906; Bude, 1911; Woolacombe, 1912 (C. W. B.). Nymphs common at Beer, July, 1910 (G. T. Lyle). Common at Churston and taken at sugar (G. T. P.).

*Pholidoptera griseo-aptera* (= *cinerea*).—Ivybridge, Torquay, at sugar, August 5th to 16th, 1899. Churston (G. T. P.). Bovey, August, 1906 (C. W. B.). Common at Bude in coarse



herbage, August, 1911; similarly at Woolacombe, August, 1912; one taken at the latter place, August 8th, 1912, distinctly reddish chestnut colour (C. W. B.).

*Metrioptera albopunctata* (= *grisea*).—Torquay, at sugar, August 5th to 16th, 1899. Dawlish (Vict. History). One at Tregantle, September, 1911 (T. V. Hodgson). One at Braunton Burrows, very light straw-colour, August 24th, 1912 (C. W. B.).

*M. brachyptera*.—Haldon Heights.

### Acridiodea.

*Gomphocerus rufus*.—Wembury; Bolt Head.

*G. maculatus*.—Woolacombe, open spaces.

*Stenobothrus lineatus*.—Wembury.

*Omocestus viridulus*.—Perranporth, August, 1909; Woolacombe, August, 1912 (C. W. B.).

*O. rufipes*.—Coast of Devon. Churston (G. T. P.). Woolacombe, August, 1912 (C. W. B.).

*Stauroderus bicolor*.—Common everywhere, with vars. *mollis purpurascens* and *nigrina* (C. W. B.).

*Chorthippus parallelus*.—Common everywhere, North and South Devon and North Cornwall (C. W. B.); with var. *purpurascens* (C. W. B.).

*Pachytylus migratorius*.—Casually in Devon.

*P. danicus* (= *cinerascens*).—Casually in Devon.

*Schistocerca peregrina*.—Thirty taken in Plymouth, October 9th, 1869; the specimens in the Athenæum Museum (G. C. Bignell).

*Tetrix bipunctatus*.—Widemouth near Bude, North Cornwall, abundant in one field only, amongst short herbage near hedge in company with *T. subulatus*, August, 1911 (C. W. B.). Odd specimens at Wanson Mouth near Bude, August, 1911 (C. W. B.). Shaugh Bridge, April 1st, 1893, and Walkham Valley, June, 1891 (G. C. B.). Watergate Bay near New Quay, August, 1910, and Newnham near Plympton, Sept. 1911 (C. W. B.). Abundant in short grass on the border of Lee Woods near Woolacombe. North Devon, in company with *G. maculatus*, August 8th, 1912 (C. W. B.).

*T. subulatus*.—As common as *T. bipunctatus* in North Cornwall, but much rarer in North Devon. Braunton Burrows, August 22nd, 1912 (C. W. B.). Bickleigh, April 22nd, 1891 (G. C. B.).

### LOCALITIES REFERRED TO.

*North Cornwall*.—Watergate Bay; Wanson Mouth; Widemouth; Bude; Mawgan; Perranporth.

*North Devon*.—Near Ilfracombe; Woolacombe; Braunton; Lee.

*Mid Devon*.—Bovey.

*South Devon*.—Loddiswell; Bolt Head.

*Near Torquay*.—Churston; Haldon Heights.

*East Devon*.—Beer; Sidmouth

*Near Exeter*.—Brampford Speke.

*South-east Cornwall*.—Tregantle; Whitsands near mouth of Tamar, on coast within fifteen miles of Plymouth; Wembury; Cann Woods; Shaugh; Bickleigh; Plympton; Newnham; Walkham Valley; Saltash (across River Tamar); Tavistock.

Kingston-on-Thames, 1913.

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## ADDITIONS TO THE MYMARIDÆ AND TRICHOGRAMMATIDÆ OF AUSTRALIA.

BY A. A. GIRAULT.

SINCE my treatment of these families as they occur in Australia, I have gathered some additional material, which is recorded in the following pages.

### 1. A NEW SUBGENUS OF MYMARIDÆ.

Belonging to the subfamily Gonatocerinæ, the following new subgenus:—

#### GONATOCEROIDES, n. subg.

*Female*.—The same as female *Gonatocerus* in all structures, but the antennæ only 10-jointed, the third funicle joint nearly as long as the pedicel, decidedly longer than either of the proximal two. Tarsi 5-jointed, abdomen subsessile.

*Male*.—Unknown.

*Type*.—The following species.

#### *Gonatoceroides australica*, n. sp. (normal position).

*Female*.—Length, 0.80 mm. General colour dusky brown, the knees and proximal three tarsal joints, together with the cephalic femora and tibiæ, pallid yellowish, the cephalic femora dusky beneath proximad. Venation dark brown, the wings hyaline. Fore wings with a straight margin at extreme apex, moderately broad, bearing about thirty-three lines of fine discal cilia, the latter absent under the venation, excepting a line or two just under the marginal vein, and a fine, stiff, straight line along the caudal margin, running distad for some distance. Marginal cilia of fore wing short; posterior wings narrow, not as wide as their longest marginal cilia, the extreme discal cilia confined to a few scattered ones at apex. Fourth funicle joint longest. (From one specimen,  $\frac{3}{8}$ -inch objective, 1-inch optic, Bausch and Lomb.)

*Male*.—Not known.

Described from a single female captured by sweeping in a forest near Ayr, Queensland, November 7th, 1912. The species resembles closely *Gonatocerus darwini*, Girault.

*Habitat*.—Australia : Ayr, Queensland.

*Type*.—No. *Hy* 1273, Queensland Museum, Brisbane ; the above specimen in xylol-balsam.

## 2. NEW HABITATS OF SOME MYMARIDÆ.

*Mymar tyndalli*, Girault, Proserpine, Queensland, November 3rd, 1912 ; sweeping miscellaneous vegetation and grass near a small pond in an open semi-cultivated field ; this specimen was much darker along the dorsum of thorax and distal half of abdomen ; it was also smaller.

*Anagrus armatus australiensis*, Girault, was captured from a window at Nelson, North Queensland, November 11th, 1912 ; female. Also from windows at Proserpine, Queensland, November 4th, 1912 ; a female.

*Stethynium cuvieri*, Girault, was captured at Nelson, North Queensland, from a window, October 19th, 1912 ; female.

*Gonatocerus comptei*, Girault (two males), was captured at Proserpine, Queensland, November 4th, 1912, by sweeping grass, forest. Also the same species at Ayr, Queensland, represented by a female taken from a window in a smith's shop, November 6th, 1912. In this species the distal funicle joints are sometimes longer than usual, longer in relation to their width, and thus not more or less subquadrate (funicles 4-8).

*Stethynium lavosieri* (female) was captured at Ayr, Queensland, November 7th, 1912, from a window in a smithy. The funicle joints were visible, and all are not subglobular, for the second joint is twice longer than broad and longest ; the other joints are subquadrate or subglobular.

## 3. SEVENTH NEW SPECIES OF STETHYNIUM FROM AUSTRALIA.

### Genus STETHYNIUM, Enoch.

#### *Stethynium latipenne*, n. sp. (normal position).

*Male*.—Length, 0.58 mm. Robust for the genus. Lemon yellowish ; the pronotum, mesocutum excepting lateral and caudal margins and more obscurely along the median line, the tegula, the cephalic third of the parapside and all of the abdomen (including that part of the phragma projecting into it) contrasting velvety black ; antennæ and legs pallid yellow, the former somewhat suffused with dusky ; distal tarsal joints dusky. Wings subhyaline. Phragma with a longitudinal median sulcus.

Differs from all the Queensland species of the genus in bearing much broader fore wings, distinctly much broader than those of *lavosieri*, and bearing at their widest part about thirty lines of fine discal cilia ; longest marginal cilia of fore wings somewhat over half those wings' greatest width and subequal in length to the longest cilia of the posterior wings ; the latter moderately broad, with about six lines of discal ciliation at apex, the mid-longitudinal cilia fading out not far caudad from apex. Cephalic marginal cilia of posterior wings distinctly longer than the greatest width of the blade.

Differs from *peregrinum* in general coloration, and in having the median thoracic sulcus.

(From one specimen, magnified as above.)

*Female*.—Not known.

Described from a single male captured on a window at Proserpine, Queensland, November 4th, 1912.

*Habitat*.—Australia : Proserpine, Queensland.

*Type*.—No. *Hy 1274*, Queensland Museum, Brisbane; the above specimen in xylol-balsam (mounted with a specimen of *Anagrus armatus*).

#### 4. FIFTEENTH SPECIES OF GONATOCERUS FROM AUSTRALIA.

##### Genus GONATOCERUS, Nees.

##### *Gonatocerus ayrensis*, n. sp. (normal position).

*Female*.—Length, 1.15 mm. Slender. Golden yellow, the head dusky black, the tip of abdomen and a narrow transverse band before it, black; funicle and club black, the pedicel suffused somewhat with dusky; middles of posterior femora and tibiæ black. Antennæ characteristic—all funicle joints long, except the first and last; the first is only two-thirds the length of the second, which is slender and subequal to the pedicel; the distal funicle joint is only half the length of the joint preceding it, which is somewhat the longest joint of the funicle, subequal to funicle joint 5 and half the length of the long club; the distal joint is oval. Scape long.

Agrees with *baconi*, and may be the female of that species, but the cephalic two pairs of legs are lighter in *ayrensis*, there is no noticeable black on the thorax, and the proximal tarsal joints are longer. Also in *ayrensis* the scape is much longer than in *baconi*, but in some species of the genus this is a secondary sexual character.

(From one specimen, magnified as above.)

*Male*.—Not known.

Described from one female captured from a shop window in the town of Ayr, Queensland, November 6th, 1912.

*Habitat*.—Australia : Ayr, Queensland.

*Type*.—No. *Hy 1275*, Queensland Museum, Brisbane; the forenoted specimen on a slide (mounted with an *Aphelinoidea*).

#### 5. SOME NEW HABITATS OF TRICHOGRAMMATIDÆ.

*Tumidiclara ciliata*, Girault, Proserpine, Queensland, November 4th, 1912, by sweeping grass in a narrow strip of jungle bordering a canal-like stream. *Abbella xanthogaster*, Girault, Proserpine, Queensland, November 3rd, 1912, a female by sweeping in the dry bed of Proserpine River; another female same place, same date, from window of a workshop in the town; three females, November 6th, 1912, at Ayr, Queensland, from the windows of a blacksmith's shop. *Abbella subjlara*, Girault, Nelson (Cairns), North Queensland, October 29th, 1912, on windows. *Trichogramma australicum*, Girault, from window,



Nelson, North Queensland, October 9th, 1912; and a female at Proserpine, Queensland, November 4th, 1912. *Oligosita pulchra*, Girault, sweeping grass near Cromarty (near Ayr), Queensland, November 8th, 1912; also at Ayr, November 6th, 1912, from the window of a smith's shop, a female. *Oligosita sacra*, Girault, from a window, Nelson, North Queensland, October 10th, 1912. *Aphelinoidea howardii*, Girault, a female, November 6th, 1912, from a window in a smithy, Ayr, Queensland.

## 6. A SECOND NEW SPECIES OF ABBELLA FROM AUSTRALIA.

### Genus ABBELLA, Girault.

#### *Abbella mira*, n. sp. (normal position).

*Female*.—Length, 0.75 mm. Rather slender. Bright lemon-yellow, marked with velvety black as follows:—The face beneath the eyes, the pronotum, at least three large spots in a longitudinal line on each side of the distal half of the abdomen, under low magnification appearing like three transverse black stripes across the abdomen (sometimes a fourth spot near base), and a large subrescentric substigmatal spot reaching half-way to the caudal wing margin and actually continued to that margin more obscurely after an interruption. Otherwise as in *subflava*.

Differs from *subflava* in the larger substigmatal spot and nearly complete banding of the wing, in bearing shorter marginal cilia around the fore wing, and in bearing a short oblique line of large discal cilia (4–5 cilia) from the stigmatal vein partly hidden by the substigmatal spot. The fore wings bear about twenty lines of discal ciliation around the apex, but only a few of the lines are very long.

(From four specimens, magnified as in the preceding descriptions.)

*Male*.—Not known.

Described from four female specimens captured July 11th, 1912, at Townsville by sweeping grass; November 6th and 7th, 1912, from windows of a smith's shop, Ayr; and on November 8th, 1912, by sweeping from the Ayr-Townsville train between Cromarty and Stewart's Creek. The specimen of *subflava* formerly recorded from Townsville is the foregoing female.

*Habitat*.—Australia: Townsville, Ayr, and Stewart's Creek, North Queensland.

*Type*.—No. Hy 1272, Queensland Museum, Brisbane; one female on a slide (Ayr, November 6th), mounted with two specimens of *A. xanthogaster*.

## 7. SIXTEENTH AUSTRALIAN SPECIES OF GONATOCERUS.

### Genus GONATOCERUS, Nees.

#### *Gonatocerus nox*, n. sp.

*Female*.—Length, 0.75 mm. Slender.

Similar to *Gonatocerus cingulatus* of Perkins, but the whole body uniformly sooty brownish, nearly black, coloured like most species of *Anaphoidea* or *Anaphes*; also in the antennæ, the fourth funicle joint

is distinctly longer than the third, the two not subequal, as is frequent with *cingulatus*. Thus, a very dark brownish species with narrow fore wings.

(From one specimen, similarly magnified.)

*Male*.—Not known.

Described from a female taken from windows in a blacksmith's shop in the town of Ayr, Queensland, November 7th, 1912.

*Habitat*.—Australia: Ayr, Queensland.

*Type*.—No. Hy 1276, Queensland Museum, Brisbane; the above specimen in xylol-balsam (mounted with the type of *Gonatocerus fulgor*, described below, and two other specimens).

# 8. SEVENTEENTH SPECIES OF GONATOCERUS FROM AUSTRALIA.

Genus GONATOCERUS, Nees.

*Gonatocerus fulgor*, n. sp.

*Male*.—Length, 0.90 mm.

Like *brunoi*, Girault, but the fore wings differ in that they are somewhat broader and shaped differently; thus they are not so regularly rounded at apex, flatter there; the discal ciliation is noticeably denser (finer and shorter), and there are about thirty-three lines; also the marginal cilia of both wings are somewhat shorter. The antennæ are different from those of *brunoi* in that the funicle joints are shorter, thus the proximal ones are barely twice longer than wide and the distal ones not more than two and a half times longer than wide. The pedicel is black, and the legs darker than those of *brunoi*, more especially the posterior tibiæ. Discal ciliation near apex of posterior wing moderately dense.

(From one specimen, similarly magnified.)

*Female*.—Not known.

Described from one male taken from a window in a smithy at Ayr, Queensland, November 7th, 1912. The fore wings of this species approach in shape those of the broader-winged and (usually) brown members of the genus.

*Habitat*.—Australia: Ayr, Queensland.

*Type*.—No. Hy 1277, Queensland Museum, Brisbane; the foregoing specimen (mounted in balsam with the type of *Gonatocerus nox* and two other specimens).

For the full treatment of the two families, see 'Memoirs Queensland Museum, Brisbane,' i. 1912, pp. 66-175.

## ON THE ICHNEUMONIDÆ OF THE DUBLIN MUSEUM.

By CLAUDE MORLEY, F.Z.S.

SOME slight account of the Ichneumonidæ contained in the Dublin Museum, so little visited by specialists, may be of use to future students of this family, more especially in respect of the Haliday types therein contained; the types of the species

described by Haliday from South America in 1836 have already been referred to by me (Entom. 1911, p. 212) and are in the Natural History Museum, London. The specimens at Dublin may be divided into ten collections of varying size and importance, thus:—(1) a general museum collection, nearly entirely of Irish origin, many with no data, extending to Ichneumoninae 186 specimens, plus Cryptinae 345, plus Ophioninae 446, plus Tryphoninae 626, to which the Pimplinae bring a total of 869 specimens. (2) a small British collection made by Mr. Brown of quite small Hymenoptera, of which 76 are Ichneumonidæ. (3) 181 German specimens, named by and acquired from Dr. Sigismund Brauns, of Mecklenburg. (4) a small collection of 91 exotic specimens, many of much interest as belonging to species not or but meagrely represented in Britain, with but some half-dozen of them given by Francis Walker to Haliday. (5) Haliday's Japanese (?) collection of sixteen specimens, set in a similar manner to that referred to by me at Entom. 1913, p. 131. (6) Haliday's Sicilian collection of sixty Mediterranean specimens, so little represented in Britain. (7) Haliday's Norwegian collection, a small one of a hundred or two specimens, evidently not taken by himself, for the mounting is extremely careless and much too bad to admit of determination; with ten specimens from Britain and, probably, West Africa. (8) Haliday's English collection, mounted and more or less correctly named by Francis Walker: 321 specimens. (9) 173 specimens captured and localized by Walker from Broadstairs, Southampton, Lizard, Isle of Wight, Land's End, Lyme Regis, and North Wales. (10) Haliday's personal British (mainly Irish) collection, consisting of Ichneumoninae 127 specimens, plus Cryptinae 769, plus Pimplinae 1011, plus Tryphoninae 1684, plus Ophioninae with total 1936 specimens, mainly in excellent condition, though few with definite locality, the Irish often marked by green sealing-wax on the pin-head, and the English sometimes similarly indicated by red. The total number in the Dublin Museum is about 3713 specimens.

In this last collection were, as has several times been supposed in my 'British Ichneumons,' the types of Haliday's species, described in his "New British Insects Indicated in Mr. Curtis's Guide" (Ann. Nat. Hist. ii. 1839, pp. 112-121), and though none were labelled as such and many misplaced by Cane, Westwood and others, I was enabled to fix the great majority. They are as follows:—

*Ichneumon phaleratus* (*Platylabus phaleratus*, Hal.) = *P. leucogrammus*, Wesm. (1853).—A solitary female.

*Tryphon hæmosternus*.—Type not found; it was placed in the genus *Polyblastus* in 1872, by Rev. T. A. Marshall, I know not upon what grounds.

*T. (Uteniscus) curtisii*.—A solitary, unlabelled specimen.

Dr. A. Roman tells me (*in lit.* 2, ii. 1912) that this species also occurs in Sweden.

*T. (Cteniscus) aurifluus* = *Exenterus geniculosus*, Schiöd. Mag. Zool. ix. 1839, p. 11 *nota*; Holmgren et Brischke. Several females, including the type; apparently not uncommon in Ireland. Sweden (Roman).

*T. (Cteniscus) phæorrhæus*.—A solitary male. The apical half of the abdomen is discally brick-red, with apices of the fifth and sixth segments bright flavous; all the legs are testaceous, with only the hind coxæ nigrescent; the clypeus, cheeks and face are flavous with a central black line down the last. In my table (Ichn. Brit. iv. 203) it should come next after *Exenterus mitigosus*, Grav., from which it differs in its subovate abdomen, inconspicuous petiolar spiracles, &c.; my record (*loc. cit.*) from the New Forest is an error. Sweden (Roman).

*Exochus antiquus*.—No Exochid in Haliday's collection has alar areolet combined with pale frontal orbits (one fragment—head, front legs, antenna, and part of thorax—is labelled "N. S.," but its frontal orbits are not pale); nor can it be an *Orthocentrus*, which genus he knew well, for he named *fulripes*, *spurius*, *ridibundus*, and *flavipes*, Grav., and possessed some one hundred and fifty specimens in all.

*E. lictor* = *E. decoratus*, Holmgr. (1873).—A solitary female, with red-marked pin.

*E. pectoralis* = *E. decoratus*, Holmgr. (1873).—A solitary male, marked "N. S.," of which the whole face and frontal orbits—not "facie orbita" only—are pale.

*E. talpa* (*Chorineus talpa*).—Type selected by me from eight specimens.

[N.B.—A couple of female *Microleptes splendidulus*—exactly as figured in Ichn. Brit. iv. 22—and a similar one labelled "*splendidulus*" by Haliday, and a male—extremely like Stephens's figure of it—placed along with them, are in the collection. Roman synonymises *Miomeris glabriventris*, Thoms. O. E. xii. 1317, with this species.]

*Periope auscultator*.—The typical and solitary female was misplaced.

*Cryptus Mesochorus (Astiphrommus) atricilla*.—Type neither indicated nor selectable.

*C. (Mesochorus) fulgurans*.—Type labelled "fulgurans" in pencil on green paper.

*C. (Mesochorus) olerum*.—Type labelled as the last; a *nomen nudum*.

*C. (Mesochorus) sylvorum*.—Type as above; the variety not indicated.

*C. (Mesochorus) complanatus* and *arenarius*.—Types not indicated nor selectable.

*C. (Helictes) fulvicornis*.—Almost certainly *Megastylus erythro-*



*stomus*, Grav. There are four of the latter in the collection, but I hesitated to select a type.

*C. (Helictes) cruentatus* = *Megastylus cruentator*, Schiöd.—Type selected by me from a series of nine Irish specimens; not indicated by Haliday.

*C. (Helictes) varius*.—Type not indicated nor selectable; the description leaves little room for doubt that it is closely allied to *Helictes coxalis*, Förster.

*Clepticus*.—Respecting this genus, I was able to determine nothing.

*Plectiscus*, *Pimpla (Ephialtes) senator*.—Type not indicated.

*Pimpla (Polysphincta) phanicea*.—Owned by Haliday to be a form of *P. percontatoria*, Müll.

*Acrodactyla madida*.—Type (a dissected female) selected by me from nine examples of both sexes; not indicated by Haliday.

*A. degener*.—Type similarly selected from seven examples of both sexes.

*Bassus serricornis*, *Euceros serricornis* = *E. egregius*, Holmgr. = *Bassus peronatus*, Marsh. A single pair, of which the female is the type, simply labelled "serricornis."

*B. (Orthocentrus) laricis*.—Correctly synonymised with *Stenomacrus fortipes*, Thoms. in Ichn. Brit. Type not indicated.

*Porizon linguarius*.—Type neither indicated nor selectable; *P. moderator* and *P. dissimilis* are the only species of the genus named by Haliday.

*Atractodes*, Grav.—Of this difficult genus are nearly two hundred specimens in the collection.

*A. inessor* = *Exolytus lævigatus*.—Type labelled "inessor."

*A. dionæus*.—Type not indicated; probably a form of the last.

*A. scrutator* = *E. lævigatus*.—Type labelled "scrutator."

*A. vestalis*.—A very long series; type labelled "vestalis." The species is now known as *tenebricosus*, Grav.

*A. albo-vinctus*.—This species is not now contained in the collection at all.

*A. arator*.—Type specifically labelled.

*A. salius*.—Type not named, and cannot now be fixed.

*A. exilis*.—Type not named nor selectable with certainty; sexes appear transposed.

*A. croceicornis*.—Type labelled with the MS. name "simulans."

*A. piceicornis*.—Type not named, and cannot be fixed.

*A. fumatus*.—Type labelled specifically.

*A. cultellator* = *foveolatus*, Grav., which latter Haliday misunderstood. A solitary female, carded, unlabelled.

*A. citator*.—Type not to be fixed.

*A. properator* = *Callidiotes (Mesatractodes, Morl.)*, *luridator*, Grav. = *coxator*, Grav.

*Lampronota fracticornis*. — Doubtless = *L. melancholica*, though a type cannot be fixed among the nine examples in the collection.

*L. crenicornis* = *L. caligata*. — Type (a dissected male) selected by me from twelve English and Irish males and females.

*L. denticornis* = *L. accusator*, Fab., as I anticipated in 1908; female type selected by me from a single pair.

Unfortunately I had no time to examine the remainder of the Parasitic Hymenoptera with any care; there are far more Braconidæ than Ichneumonidæ, with no types yet excavated from the general chaos. Among the Chalcididæ I discovered a little group of specimens, named in Walker's caligraphy, which I believe to be part of the types of his Mon. Chalcid.; and further investigation should yield much of interest in both these families and the Proctotrypidæ, of which Haliday also wrote between 1833 and 1839.

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## LIFE-HISTORY OF *HESPERIA LINEA* (= *THAUMAS*).

BY F. W. FROHAWK, M.B.O.U., F.E.S.

(Continued from vol. xlv. p. 256.)

THE young larvæ which hatched from the eggs and spun themselves up for hibernation during the first week of August, 1912, commenced emerging from their hibernacula on April 16th, 1913, by eating their way out of the cocoons, and shortly after fed on the tender blades of grass. One was separated from the rest and kept isolated for the purpose of observation, to which the following descriptions refer.

After each meal it rested lying along the centre of the blade; after feeding two or three times it spun two cords of silk from edge to edge of the blade, drawing them partly together, in which it lived. On the seventh day six cords were spun across the blade.

The first moult took place on May 6th, twenty days after hibernation.

After first moult, the ground colour is very pale greenish-ochreous, greenest over the middle segments. Head ochreous, clypeus darker, eye-spots dark; surface granular, sparsely sprinkled with little black knobbed processes; the body has a granulated surface resembling lizard skin, and is beset with tiny black stud-like knobs. A medio-dorsal green line extends from the head to the eleventh segment, which is uniformly pale ochreous without any markings, and beset laterally with sharply-pointed simple white hairs; the medio-dorsal line is edged with light ochreous; a fine subdorsal whitish line edged with green;

the spiracles are outlined with dark brown; legs and claspers ochreous. There is no dorsal collar on the first segment as in the previous stage.

Second moult, May 19th, the second stage occupying thirteen days.

After second moult it measures 7 mm. long; ground colour bright green; a medio-dorsal darker green stripe bordered by a pale yellowish line; a fine subdorsal whitish line bordered on each side by a darker green line, and a whitish lateral line. The head is light greenish-ochreous, clypeus and medio-frontal line darker and continuous with the body stripe, eye-spots black; the surface is finely granular and sprinkled with minute black points. The body is likewise granular, and is beset with minute stud-like processes; the anal segment is fringed with whitish hairs. The ventral surface is flattened. If disturbed when out of its dwelling it falls to the ground and rolls in a complete ring, remaining so for a short time.

Third moult, May 27th.

After third moult measuring 14 mm. long. Head very pale whitish-ochreous-green, with a slightly darker central band continuous with the medio-dorsal stripe, clypeus very indistinct, otherwise it is similar to previous stage; the pale spiracles are placed on a very fine pale line.

Fourth moult, June 6th.

After the fourth and last moult, fully grown, the larva measures 21 mm. long. The head is globular, the surface reticulated and sprinkled with minute white bristles, eyes dark; the colour is ochreous-green with a slightly darker green band down the centre, but very faint. The body is swollen in the middle, tapering at the ends, the first segment is small and narrow, the anal segment terminating in a projecting flap, the segments subdivided into six divisions, the first one being much the widest; the ground-colour is grass-green with a rather darker green longitudinal medio-dorsal band intersected by a central paler line, and bordered on either side by a pale yellowish line, and a similar subdorsal line; the small yellow spiracles are situated on a fine pale line followed by a conspicuous yellowish-white lateral stripe, the ventral surface is darker green, on each clasper is a whitish crescentic mark. The first and last segments are wholly green. The legs fleshy-ochreous. Between the ninth to tenth and tenth to eleventh segments is a ventral patch of white waxy substance.

The larva became fully grown and spun up for pupation on June 15th, and pupated June 17th. The larval state occupying 311 days.

The pupa varies in length from 16 mm. to 19 mm. long. It is slender and tapering.

Dorsal view: The head bears a short frontal conical point,

from the base of which the head slopes off to the rather prominent eyes; across the neck it is slightly contracted; base of wings rather swollen, and very slightly narrowed across the middle; the abdomen gradually tapering to the long cremastral horn, which is furnished with a cluster of projecting amber-coloured hooks.

Lateral view: Head rounded with a central conical point; thorax rounded, which is the greatest diameter of the pupa; slightly sunken at the metathorax, the abdomen gradually tapering to anal segment, which terminates in a long flattened cremaster with a cluster of hooks only at the extremity; the ventral surface forms almost a straight line. The long tongue-case, which is free from the apex of wings, reaches to the anal segment.

The whole surface is granular and covered thickly with white powdery bloom of a waxy nature. On the head-horn are a few fine whitish bristles.

Colouring: Immediately after pupation the head, thorax, and basal half of wings are pure rich brilliant green; the apical half of wings paler; the abdomen yellow-green; the terminal detached portion of tongue-case is deep ochreous; the cremaster and head-point flesh-colour. It is striped longitudinally like the larva. By slow degrees the colouring matures and loses the brilliancy; the abdomen becomes whiter, and the wings and thorax duller.

When seven days old the head is green, spread with a pinkish bloom, the frontal point deeper lilac-pink; thorax grass-green; wings greyer green; abdomen whitish-yellow-green with a medio-dorsal longitudinal grass-green stripe, the last two segments fading into pale lilac; cremaster darker.

Just before emergence the pupa assumes a dull smoky-black, segmental divisions pale greenish, and wings dark copper-red.

It is attached to the grass-blades by a cincture round the middle and by the cremastral hooks to a pad of silk spun on the surface of the blades; usually three or four blades are spun together forming a tubular shelter in which the pupa is more or less concealed.

The pupal period extends from twelve to seventeen days, according to temperature.

The individual described, which pupated on June 17th, produced a male imago on July 4th, remaining seventeen days in the pupa. One that pupated July 3rd, 1912, emerged July 16th (a female), remained thirteen days in pupa. Another which pupated on July 10th, emerged on July 22nd, also a female, was twelve days in the pupal state.



## BY THE WAY.

"WHAT is the ox-warble fly?" The question raised quite a flutter of excitement in the Mother of Parliaments this afternoon [July 10th, 1913]. Mr. Chas. Bathurst, who is a great authority on all matters agricultural, in the course of a question to the Vice-President of the Irish Board of Agriculture, suggested that this quaintly-named creature caused great devastation to hives. That propensity did not arouse the languid interest of the Irish, although it appeared to have the support of the Chief Secretary for Ireland, who answered the question. Mr. Bathurst was not only anxious about what the ox-warble fly does, but he was gravely concerned because the English and Irish Boards of Agriculture gave entirely different accounts of its life history. The House pricked up its ears at this suggestion of division in Ministerial circles, and awaited with some interest Mr. Birrell's answer to the supplementary question. Mr. Birrell was equal to the occasion. "This sort of thing often happens in biography," said the right hon. gentleman, resuming his seat amid much laughter, and a determination on the part of many members to "read up" at an early opportunity all about "the ox-warble fly." . . . .

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Many Londoners will be cheered to-day by the grateful intelligence that Boxhill, one of the beauty spots of outer London, has been saved from the jerry-builder. The announcement was made this afternoon by Sir Robt. Hunter at a meeting of the National Trust. It would appear that a public benefactor in the person of a gentleman who modestly desires to remain anonymous has made an offer to purchase a part of the magnificent estate upon which Boxhill stands and to present it to the Trust for the use of the public. For generations now Boxhill has been one of the most appreciated pleasure haunts of Londoners. It lies within a short distance of Dorking, and the public have for generations been allowed to roam over its heights and enjoy its delightful vistas of Surrey, Hampshire, and Sussex.—(Daily Paper.)

C. M.

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NOTES AND OBSERVATIONS.

NOTE ON PARASITES OF *HYGROCHROA SYRINGARIA*.—In the August number of the 'Entomologist' (vol. xlv. p. 245) I notice that a letter written by Dr. E. R. Buckle to Mr. Claude Morley has been appended to my description of a new species of *Meteorus* (Braconidæ), *M. niger*. As this letter appears in one or two respects to be at variance with the description, perhaps I may be allowed a few words of explanation. Dr. Buckle mentions that the larvæ of *Hygrochroa*

*syringaria* which he had under observation hung themselves from the food-plant or roof of the breeding-cage by a thread, and that next day a larva so suspended was found to have a pupa-case of an ichneumon suspended from it. The letter reads as if this occurred with all the thirty larvæ mentioned by the writer. Although I have known a similar instance myself, it must not be taken that such is usually the case. In the ordinary way the parasitic larva emerges from the host when the latter is resting on a branch or leaf of the food-plant, attaching itself to the pabulum before quite severing connection with the host. When confined in a breeding-cage, the slightest jar causes the larvæ of *H. syringaria* to drop, as described by Dr. Buckle, and it is easy to see that when weakened by the presence of a parasite they may be unable to climb back, and that consequently the parasitic larva is obliged to emerge when the host is in this unusual position. In a state of nature such a thing must be of rare occurrence. To quote from the letter: "The fly emerged by cutting off a circular cap from the lower end of the pupa-case, or, in a few cases, by eating a rather irregular hole through the side of the case." Now, with *M. niger*, as with all other Meteoridæ with which I am acquainted, the fly invariably removes a circular cap, the irregular holes that Dr. Buckle describes were no doubt made by hyperparasites, probably a species of *Hemiteles* or *Mesochorus*. Again, to quote: "The darkest specimens, the males, all came out first; and then the rather softer-bodied females, which had a yellowish patch in the center of the dorsal surface of the abdomen." In *M. niger* the female is quite as dark as her mate, not one of the hundred or so specimens I have examined showing any sign of such a yellowish patch as mentioned. In some species of *Mesochorus*, however, which I have bred hyperparasitically through Meteoridæ, such markings are usual, so that I think if Dr. Buckle will re-examine his specimens, he will find that he has confused the parasite with the hyperparasite. *Mesochorus* is, of course, widely removed from *Meteorus*, though in size the parasite and hyperparasite agree. In the study of the Parasitica, the snares and pitfalls set for the experienced student are very numerous; for the novice or unwary observer their name is legion.—G. T. LYLE; Brockenhurst, August 8th, 1913.

ARASCHNIA LEVANA AT CARDIFF.—Your correspondent Mr. T. Butt Ekins would be well advised to compare the insect which he assumes to be *A. levana* with the Continental spring form of this butterfly. Possibly, misled by the description in the text-book quoted, he has mistaken *Hamearis* (*Nemobius*) *lucina* for *levana*, which, by the way, is not a "fritillary" at all. It has, I believe, never been reported British, even in the imaginative days of the "Kentish Cabinet"; but it is difficult to understand why this species, which is not uncommon on the opposite side of the Channel, in the north-east departments of France, should not be indigenous or have established itself in our southern woods. It does not occur in the north-west of France, or Brittany, for example; but in the Nord is reported from the Forest of Mormal (Le Roi); and my correspondent M. Postel, of Fonequevillers, Pas-de-Calais, informs me that it is

common in the department of the Somme at Aveluy, occurring also at Mailley-Maillet, and Coigneux. If Mr. Butt Ekins has not already determined the species of his capture and cares to send it to me for inspection I shall be happy to identify the same; or I will send him, with pleasure, a specimen of the French *levana*, first brood.—H. ROWLAND-BROWN; Oxhey Grove, Harrow-Weald, August 18th, 1913.

GEOMETRA VERNARIA IN SCOTLAND.—While collecting at dusk I netted a specimen of *Geometra vernaria*, and was surprised to find on referring to 'Moths of the British Isles' that this species is practically unknown up here. I shall be glad to know if there is any other instance of one of this species having been captured in Argyllshire or as far north as this.—JAMES N. SLOON; Blairbeg, Blairmore, Argyllshire.

LITHOSIA LUTARELLA PYGMÆOLA IN NORFOLK.—While collecting recently on the sandhills at Winterton, Norfolk, I took four specimens of *Lithosia lutarella* var. *pygmæola*, one at sugar on a bunch of marram heads, the others at rest on the marram grass. Two were taken on August 11th and two on August 14th. The weather at the time was unfavourable for collecting, the wind blowing steadily from the north-east, so that I had no opportunity of judging how plentiful *pygmæola* really is in what I imagine to be a hitherto unknown locality.—FRANCIS H. LYON; 89, Clarence Gate Gardens, London, N.W.

CYANIRIS ARGIOLUS OVA ON PORTUGAL LAUREL.—On May 27th I noticed *Cyaniris argiolus* ovipositing on Portugal Laurel. I found two ova at the base of the terminal buds of two flowering sprays. Larvæ from these hatched out on June 5th, and are feeding up well. There is plenty of holly in the garden.—(Rev.) C. A. SLADEN; Alton Barnes Rectory, Pewsey, Wilts, June 24th, 1913.

CŒNOCALPE VITTATA (PHIBALAPTERYX LIGNATA).—On June 16th and 17th I caught a few specimens of *P. lignata* locally, from which I obtained a small batch of ova. I placed the ova on *Galium verum* and the larvæ commenced to emerge on June 28th. The first opportunity I had of counting the larvæ I found thirty-seven about half-grown; they fed up very well, showing a preference for the buds and flowers of the bedstraw. The first of the larvæ pupated on July 18th, and the remainder during the next five or six days; they spun up amongst the food plant mainly, while a few made slight cocoons on the surface of the sand. The moths—nineteen males and eighteen females—emerged upon the following dates: July 31st, eight; August 1st, eleven; August 2nd, ten; August 3rd, four; August 4th, four = nineteen males, eighteen females; all fine specimens except two (slightly crippled). I have a good lot of ova from a pairing and hope to carry on a further brood. Perhaps I should add in conclusion, these have been reared in my greenhouse.—W. A. TYERMAN; Chesterfield Road, Ainsdale, Southport, August 5th, 1913.

COLIAS EDUSA IN ISLE OF WIGHT.—On August 14th I captured two male specimens of *C. edusa* at Whitecliffe Bay, near St. Helens, Isle of Wight. Is this part of a summer brood or a summer immi-



gration?—A. CAPEL MORRIS; Brookfield, Binstead Road, Ryde, I.W., August 15th, 1913.

COLIAS EDUSA IN ESSEX.—Mr. A. Luvoni informs us that at Westcliff, Essex, he captured seventeen specimens of *Colias edusa* during the second and third weeks in August of this year. Both sexes were represented in about equal proportion.

COLIAS EDUSA IN HANTS, WEST SUSSEX, AND NOTTS.—*C. edusa* is about this year. I have seen a dozen or so, and caught a beautiful example of var. *helice*.—(Major) R. B. ROBERTSON; Hillingbury Cottage, Chandler's Ford, Hants, August 23rd, 1913.

On August 5th last I saw here a specimen of *C. edusa*. It was in good condition.—W. M. CHRISTY; Watergate, Emsworth.

I captured a male specimen of *C. edusa* in the Blidworth district, Notts, on August 20th.—JOHN RANDLE; Annesley Road, Hucknall, Notts.

COLIAS EDUSA AND DASYPODA HIRTIPES IN SUSSEX.—I took a female specimen of *Colias edusa* near Shoreham, Sussex, on August 7th. A few days later the species was quite common; at one time I noticed three sporting together. In a sandy spot near the sea I noticed a colony of the Hairy Bee (*Dasypoda hirtipes*), which were burrowing holes in the sand to a considerable depth.—W. PASKELL; 85, Second Avenue, Manor Park, E., August 19th, 1913.

HELIOTHIS PELTIGERA AND ACIDALIA FUMATA IN HAMPSHIRE.—I have to record the capture by myself of *Acidalia fumata* and *Heliothis peltigera* on Hayling Island, June 25th and 27th respectively. Both moths were females, and each deposited a number of fertile ova.—A. T. POSTANS; 55, Raglan Street, Southsea, Hants, July 21st, 1913.

GELECHIA VELOCELLA AT WANSTEAD.—Until Wednesday last I had never met with more than five or six specimens of this local moth, but on this occasion, when crossing a dry piece of meadow land, I noticed the second brood in abundance amongst the dried-up stems of its food-plant (*Rumex acetosella*). I managed, after many attempts, to box a couple for verification. This is the most active member of the genus with which I am acquainted. Duponchel certainly gave it a most appropriate name!—A. THURNALL; August 1st, 1913.

SELIDOSEMA ERICETARIA (PLUMARIA) IN SCOTLAND.—As I notice that so recent an authority as Barrett states that *Selidosema plumaria* has not been observed in Scotland, it may be of interest to record that I found it early this month in several localities at the west end of Loch Shiel in Argyllshire. It occurred usually at a moderate elevation, and rested on the rocks in company with *Anaitis plagiata* and *Dasydia obfuscaria*, from the latter of which it was difficult to distinguish on the wing.—C. N. HUGHES; 3, Wyndham Place, Bryanston Square, W., August 16th, 1913.

CRYMODES EXULIS ASSIMILIS AT BRAEMAR.—I have much pleasure in recording the capture of a specimen of *Crymodes exulis* var. *assimilis* at Braemar in July last. With the exception of a piece



out of the inner angle of the left front wing it is in very fair condition. Although it seemed an ideal night for sugaring, there was only one other insect (an *Hadæna adusta*) on the whole of my patch. Mr. Arthur Horne, of Aberdeen, kindly identified it for me, and his decision was confirmed by Mr. J. P. Mutch, of Hornsey Road.—ROLAND G. BENTON; Muswell Hill, N.

DEIOPEIA PULCHELLA IN DERBYSHIRE.—May I bring to your notice the capture of a female *Deiopeia pulchella*. The moth was taken on June 14th by a member of the Trent College Nat. Hist. Soc., and was beaten out of laurel bushes in the college grounds. It is not a good specimen, probably owing to the buffetings received on its long journey. I believe there are very few, if any, records of the capture of *Deiopeia pulchella* in a locality so far from the sea as Trent, and, so far as I know, it is some years since it was taken at all in England.—H. H. WALLIS; Trent College, Derbyshire, July 24th, 1913.

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### RECENT LITERATURE.

*The Remarkable Life-history of a new Family (Micromalthidæ) of Beetles.* By HERBERT S. BARBER, Bureau of Entomology, Washington, D.C.

In this paper, which has just appeared in the 'Proceedings' of the Biological Society of Washington (vol. xxvi. pp. 159-190, August 8th, 1913), Mr. Barber has given a further account\* of his very interesting observations on the life-history of a little North American beetle, *Micromalthus debilis*, Lec. Although some of the most important stages in the life-history have not yet been observed, the facts already brought to light are more than sufficient to justify the claim that the life-history of this beetle is "the most remarkable in the Coleoptera, if not one of the most remarkable in the whole class Insecta." *Micromalthus* "combines in its life cycle—eggs by two methods of reproduction, seven or eight forms of larvæ, adults through two distinct lines of larvæ, oviparous pædogenesis and viviparous pædogenesis." The larvæ live in rotten wood, and amongst them one form was observed which was more robust than the others, and appeared to be almost free from segmentation; this gave birth to a number of living young—minute white larvæ, distinguished by having long slender legs of the Caraboid type: that is, with a distinct tarsal segment provided with two claws at the end. These larvæ constitute a sort of migratory stage. They crawl away and wander for a time, then start burrowing in the wood, feed a little, and after a week or so moult into the second form, which is legless and much resembles a Cerambycid larva. After one or two more moults the Cerambycid larva either rarely pupates, or usually moults, disclosing the pædogenetic form. After a period of about two weeks the young, numbering from three or four to thirty or forty, but usually about ten, are born, tail first, and begin the new generation. Certain individuals of the pædogenetic form, however, do not develop

\* A preliminary account appeared earlier this year (Proc. Ent. Soc. Washington, xv. No. 1).

embryos, and of these many die apparently barren, but others void, through the vulva, instead of several migratory or "caraboid" young, a single, large, soft, oval egg, which adheres to the side of the mother, and hatches in eight or ten days into a first stage larva utterly unlike the previous forms, and which much resembles a weevil larva in appearance. This larva feeds on the contents of the mother's body, and when full-fed changes into another form of larva having short, stumpy, three-jointed legs, and later pupates. It appears that from the pupæ thus derived only male beetles are developed, whereas from the pupæ derived directly from the Cerambycoid form of larvæ only female beetles emerge. If subsequent observation confirm these results, we shall be faced with some extremely interesting facts indeed. Mr. Barber has not yet succeeded in getting the male and female beetles to pair, and has therefore not been able to observe the stages following upon the ordinary sexual mode of reproduction. He hopes to give a complete account of the extraordinary life-history of this beetle at a later date. We shall await it with the keenest interest.

C. J. G.

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*The Life-history of Panorpa klugi*, McLach. (Journal of Coll. of Agric. Univ. of Tokyo, vol. iv. No. 2). By T. MIYAKE. Pp. 117-139, and 2 plates shewing larva and pupa, and structural details. Tokyo, 1912.

In 1863 Brauer gave a life-history of *Panorpa* based on observation of several European species. In 1895 Felt gave the result of his observations of the larval stage of the American insect, *Panorpa rufescens*. In the present paper Miyake is able to give the complete life-history of a Japanese species, *Panorpa klugi*. Enderlin places this and other Japanese species in a new genus, *Aulops*, but Miyake, after his work on this insect, does not consider the separation justified.

Our author gives a description of his breeding-cages, and especially the method employed for keeping the interior damp without excess of moisture. He fed his larvæ on wounded or dead insects, since meat was not found to be satisfactory. The eggs were first put in Petri dishes, and great care was necessary to preserve both eggs and larvæ from vegetable and animal parasites and other foes.

Although cases have been mentioned of *Panorpa* preying on living insects, Miyake considers, and no doubt correctly, that such an occurrence is very exceptional, and that the food consists of dead or injured or even partially decayed insects. They sometimes feed on vegetable matter, e.g. petals of *Silene armeria*.

After describing copulation, egg-laying, and eggs, Miyake gives a full description of the larva. The egg stage lasts about a week, and he concludes that the larva undergoes seven moults in ten to fifteen days, but the last stage lasts over a month. There are changes in the spiracles, also seven in number. The full account of larval habits is interesting reading. The pupa is free in its burrow, and this stage lasts six or seven days for the first brood. In his cages Miyake found that the females often lived more than a month, but the total length of life may be longer in natural conditions. Eggs

are laid in May or June, and again in August or September. Consequently there are two broods a year, and this seems to be the case with *P. germanica* in Britain—sometimes, at any rate. The winter is passed by the larva, in its last larval stage, in the burrow.

Two excellent plates illustrate the earlier stages of the insect. Miyake concludes his paper with the description of a subspecies, *nigra*, of which apparently *P. nipponensis* and *P. brachypennis* are only other forms.

W. J. LUCAS.

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*The North American Dragonflies of the Genus Aeshna* (University of Toronto Studies, Biological Series). By E. M. WALKER, B.A., M.B. Pp. 213. Toronto, 1912.

THERE has for a long time been a difference of opinion as to the spelling of the name of this genus. *Aeshna* is generally used in Europe, and will probably continue to be used, especially as the change to *Aeshna* would introduce a difficulty in connection with compounds such as *Amphiæschna*. This matter is, however, unimportant in face of the excellent monograph of the North American members of the genus which Mr. Walker has produced.

Throughout the work it is very obvious that our author is an experienced field naturalist, and we are therefore not surprised to find some fifty-six pages devoted to the biology and bionomics of the American *Æschnas*. The entomologist, therefore, who takes a comprehensive view of his science (although he may not study dragonflies in particular) will wish to inspect this monograph. Following these introductory pages are full, elaborate keys for the identification of both males and females, and in addition such nymphs as are known to science. Each species is then most fully treated, and the distribution, habits, relationships, and so on, are not forgotten.

Of North American *Æschnas*, there are sixteen species, according to Walker, with four forms to *Æ. interrupta*, and two to *Æ. umbrosa*. In Europe there are nine, while in Britain we have six. Of these one species, *Æ. juncea*, is common to Europe and North America, this being a British species also.

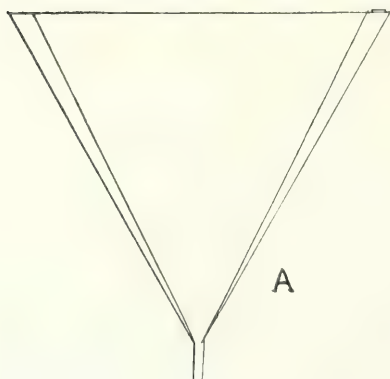
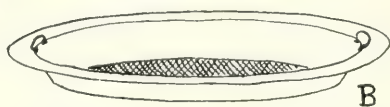
After a list of works cited, we come to the plates, twenty-eight in number, six illustrating the abdomens of the imagines being coloured. All are excellent. Though we possess but six *Æschnas* to the North American sixteen, yet it is evident from the plates alone that there is much less diversity among the American species than amongst our own. Across the Atlantic there are none that resemble our *Æ. grandis* and *Æ. isosceles*.

Mr. Walker mentions an interesting observation of *Æ. constricta* ovipositing in the stem of a sweet-flag (*Acorus calamus*) some two and a half feet above the water. He thinks the eggs fall out as the plant withers. On one occasion I saw a *Platynemis pennipes* to all appearance ovipositing in the stem of a yellow water-lily flower some inches above the surface. If eggs were laid, they would later have been brought below the surface, when, after flowering, the fruit came down to water-level, as is the custom with this plant. Is it not necessary for the eggs to remain moist?

W. J. LUCAS.







BERLESE INSECT COLLECTING FUNNEL.

# THE ENTOMOLOGIST

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## THE BERLESE FUNNEL.

By C. B. WILLIAMS, B.A., F.E.S.

(PLATE XI.)

It is remarkable that so little use has been made in this country of the interesting piece of apparatus invented by Berlese, in Italy, for collecting minute insects from soil, moss, or other similar materials. Although initially a little expensive, it is so simple to use and so efficient in collecting that it should appeal to all who take any interest in the smaller insects, Acarids, and other Arthropods.

The apparatus (Plate xi.) consists essentially of a double walled metal funnel (fig. A), with a fine mesh sieve across the top and a tube leading to a small bottle at the bottom. The space between the two walls of the funnel is filled nearly to the top with water, which is kept warm by means of a small ring burner.\* The material to be examined is broken up, if necessary, and spread out on the sieve, when the numerous small animals which it contains, moving downwards towards the warmth and away from the light, pass through the holes in the sieve, slip down the sides of the funnel and fall into the bottle at the bottom.

The dimensions of the apparatus shown on the plate are as follows:—Total height on stout iron tripod stand, 3 ft. 4 in.; outside diameter of funnel, 24 in.; depth of funnel, 20 in.; space between the two walls at the top, 2 in.; the tray sieve which rests in the top of the funnel is 3 in. deep and has a projecting lip (fig. B) to prevent any rubbish getting down between it and the funnel. The tube at the bottom, leading out

\* In the plate the burner is shown attached to a retort stand. This, of course, is unnecessary, as it could easily be fixed to one of the legs of the stand.

of the funnel, is 1 in. in diameter.\* The sieve itself consists of perforated zinc with holes 1 mm. ( $\frac{1}{25}$  in.) in diameter.

The total cost in stout sheet zinc with an iron stand was a little over £2; copper would be more lasting, but correspondingly expensive.

The measurements could, of course, be altered to suit circumstances, and for general purposes one rather smaller than the above, about 18 in. in diameter, would be most convenient, while one even smaller than this would be quite useful.

The water in the funnel should be kept at a temperature of about 105–110° F., when the greater part of the catch will come through in the first twenty-four hours. If the raw material is plentiful, it is best to put in a fresh supply at this point, but if there is only a little of it to hand, or if it is for any reason required to examine more thoroughly any one lot, it may be left in several days.

For ordinary purposes 70 % alcohol is the most convenient material to put in the bottle, but any fixing fluid may be used, while, if plain water be used many of the insects will remain alive until examined. For this it is most convenient to turn it out into a watchglass or shallow dish, and by examining under a dissecting microscope, any desired specimen can be removed with a fine pipette.

A certain amount of rubbish or small particles of soil always comes through the sieve, especially from such materials as soil and peat, moss on the contrary giving practically none. Almost anything that will go into the sieve may be examined: soil, moss, garden rubbish, dead leaves, decaying wood, peat, grass, seaweed, birds' nests, &c., while to give an idea of the variety of material obtained, I may mention the following:—Small worms; shells; woodlice; spiders; chelifers; Acarids (in profusion, especially Orobatiidæ); Miriapoda (Chilognatha, Diplopoda, Symphyla, Pauropoda); Protura; Thysanura (especially Campodeidæ); Collembola (in profusion); Aphaniptera (from birds' nests); Thysanoptera; Psocidæ; Aphids; Psyllids; Hymenoptera (ants, winged and wingless Chalcids, Prototripids, &c.); small caterpillars; Coleoptera (Staphylinidæ, small Carabidæ, Trichopterygidæ, &c., and numbers of larvæ); Diptera (of all sorts, including wingless forms and numbers of larvæ). In fact, there is scarcely any group of insects of which representatives are not at some time found.

The John Innes Horticultural Institution,  
Merton, Surrey.

\* Care should be taken that in the making there is no projecting inside at the joint of the funnel and the tube, which would prevent things slipping past into the bottom.

COMPLETION OF THE LIFE-HISTORY OF *MELANARGIA*  
*JAPYGIA* SUBSP. *SUWAROVIVS*.

By F. W. FROHAWK, M.B.O.U., F.E.S., and the Hon.  
 N. CHARLES ROTHSCHILD, M.A., F.L.S.



*M. swarovius* depositing.

In a previous article\* we gave an account of the habits of *Melanargia japygia* subsp. *swarovius*, and described the egg, the larva before its first moult, the adult larva, and the pupa.

In the present paper some further details are recorded concerning the habits of this insect, and descriptions of the remaining stages are given.

On June 19th at 11 a.m. a female was observed depositing at Pusztá Peszér. The butterfly flew from a thistle bloom in one of the flat open spaces to a "buczka" (sandhill), and alighted on a blade of *Festuca glauca* var. *scabrifolia*, very rapidly sliding over to the position shown in the drawing, the weight of the

\* 'Entomologist,' vol. xlv. No. 592, pp. 1-5. 1912.



insect causing the grass to bend over. The butterfly held on to the grass by the hind legs only, the middle pair being folded across the thorax. By this device the abdomen is brought as close as possible to the grass blade. The insect then curved its abdomen almost in a circle and deposited two eggs, touching each other on the grass parallel to the longer axis of the grass blades. As the butterfly flew up the grass went back with a jerk.

Again, on June 23rd about noon, six females of this butterfly were observed depositing. They all assumed the attitude already described. Two of the females deposited respectively a single egg and two eggs on the inflorescence of *Koeleria gracilis*. A third deposited two eggs on the inflorescence of *Poa pratensis*. A fourth, four eggs on a blade of *Stipa* (probably *capillata*), laid in a row touching each other, and parallel to the longer axis of the blade. A fifth, a single egg on a flower stalk of *Asperula cynanchica*. The sixth female deposited five eggs on a plant of wild asparagus (*A. officinalis*), again laid in a row, and all touching each other. In our previous article we recorded the fact that a female had been observed by Miss Wertheimstein to deposit on *Festuca sulcata*, and that the larva had been found feeding on this plant.

On August 23rd, 1912, the various plants of different grasses containing the eggs deposited between June 10th and July 5th were carefully examined, and to our surprise we found several larvæ had been feeding, and were considerably grown and green in colour, the grass selected by the larvæ being *Poa annua*, although they were supplied with different kinds of *Festuca* and other grasses. They had eaten large pieces out of the edges of the *P. annua* blades.

All the young larvæ in our possession hitherto had immediately entered into hibernation upon emergence from the egg. The larvæ were in various stages, several had apparently only just started feeding; a large number were perfectly quiet, resting close to the egg shells, and had neither eaten nor moved since hatching. Also many were resting on the dead *Festuca* blades, which they closely resemble in colour.

Upon placing a number of larvæ on fresh plants potted up, some pots containing mixed plants of *Festuca* and *P. annua*, we noticed some of the larger larvæ almost immediately started feeding on the *P. annua*.

On August 29th one larva had fixed for moulting, and moulted the first time on September 1st, 1912.

Shortly before first moult it measures 4.75 mm. long. The ground colour is a clear light green, with fine medio-dorsal, sub-dorsal, spiracular and lateral olive-brown lines, and a broad super-spiracular stripe of the same colour. Head and legs pale ochreous-greenish, claspers green.

After first moult (forty-five days after) it is 6.35 mm. long. The head is green, roughly granular, and studded with whitish hairs, each with a translucent bulbous base. The body is glaucous-green, with olive-brown longitudinal lines; the medio-dorsal line is clearly defined and bordered by a fine whitish-green line; the super-spiracular stripe is broad and suffused, darkest along the upper edge and bordered below by a whitish lateral line; immediately above the black spiracles is a fine pale green line intersecting the suffused band; there is also a fine sub-dorsal brown line; above the claspers is a fine brown line. The anal points are whitish. The body is rather densely sprinkled with slightly curved simple brownish hairs with black bases above the spiracles, while those covering the sub-spiracular and ventral surface are whitish with pale bases. The legs and claspers are green.

Several of those which fed during the autumn survived hibernation and started feeding at the beginning of March, 1913. After feeding occasionally for a few days, the first one fixed itself for the second moult on March 9th, and moulted March 15th. This individual on March 31st (after second moult) measured 8.47 mm. long and somewhat stout in proportion, and very similar in all details to the previous stage. The head pale green, deeply pitted with darker green, which gives to the naked eye a rather ochreous-green appearance. It rests in a straight attitude, and feeds both by day and night.

Other examples moulted a second time during latter part of March. The same specimen moulted the third time on April 21st, being thirty-seven days in the third stage. After third moult (seven days after) it measures 15 mm. long. Excepting having paler coloured spiracles, greenish legs, and less prominent points on the head, it is exactly similar in all details to its subsequent stage—*i. e.* after the fourth and last moult, previously described in this Journal.

The fourth moult occurred on May 16th, the fourth stage lasting twenty-five days. It became fully grown at the end of May, and pupated during the first week of June. The larval existence extended between ten and eleven months.

The imago, a fine male, emerged July 4th, the pupal stage occupying a month. In Hungary the normal time of appearance is about the middle of June. The climate of England is entirely different from that of Hungary, the summer being moist and cool instead of very dry and very hot, and the winter moist and warm rather than dry and very cold. Our observations, carried out in this country in 1912 and 1913 on the larvæ of *suvarovius*, show that the majority of the young larvæ hibernate without feeding directly after emergence from the egg, but a few of them after remaining motionless for four or five weeks commenced to feed, moult, and hibernate after the first moult.

So far only those larvæ (*i. e.* those which fed before hibernation) have survived in England, all the rest dying during hibernation or just after. In Hungary it is possible that the larvæ have similar habits. The fact that the eggs are deposited on many plants, some of which cannot possibly be food-plants of the larvæ, seems to indicate that the larvæ hibernate without feeding, resting during the late summer and autumn on the plants where the eggs were deposited, until they are ultimately beaten down by the snow. It is, however, by no means certain that the young larvæ may not *after a time* leave the spot where the egg was deposited, and commence feeding before hibernation.

Finally, it may be possible that Nature has devised a plan to avoid the dangers in the summer of a drought, and that some of the larvæ hibernate without feeding at all, and some commence to feed before hibernation, if the grasses are not already too much dried up.

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### A BRIEF VISIT TO MALACCA.

By J. C. MOULTON, B.Sc., F.R.G.S., Curator of the  
Sarawak Museum.

I SUPPOSE everyone who has pretensions to the title of entomologist has read Wallace's 'Malay Archipelago,' and while some may probably regard the chapter on Celebes as their favourite, others will read with renewed interest and delight the chapters on the Orang-utan of Borneo or on the Birds of Paradise of New Guinea; a few others, more fortunate, may have been to Malaya and seen some of the very places visited by the famous naturalist now nearly sixty years ago.

Having had occasion to pay a brief visit to Malacca lately, I thought perhaps a few notes might be of interest to readers of the 'Entomologist,' who would like to be reminded of Wallace's collecting days there in 1854.

From Singapore it takes about twelve hours by sea or rail to reach Malacca; the former route is perhaps preferable, though one is apt to arrive off the town at 2 a.m., at which hour a three miles row ashore does not appeal to the sleepy traveller any more than does the next stage in the proceedings, which is to bang on the doors of the rest-house until one of the sleeping inmates is moved to admit the disturber. Owing to the shallow water no steamers can approach the shore, although a long pier juts out invitingly, but closer inspection shows that this is now no longer in use, and, in fact, is dangerous to walk upon. To this lack of encouragement to passing ships to stop and enliven the place, Malacca, no doubt, owes its long continued air of peace and quiet, disturbed though it is on occasions by week-end invasions of motor-cars from neighbouring rubber estates.



Wallace's description, written over fifty years ago, still holds good to-day, and I quote it in the footnote below.\*

But this peaceful "left behind" existence is by no means characteristic of the old Malacca, the fortified Malacca of the Portuguese, the trading centre of the Dutch or the Malacca in the early days of the British occupation. Briefly its history is this:—

After about a century of prosperous growth the Malay city of Singapore was invaded and sacked by a Javanese prince; a certain number of survivors however escaped and fled up the west coast of the Malay Peninsula, and founded the city of Malacca about 1250 A.D. Here they flourished under their Malay chiefs until the advent of the Portuguese under Albuquerque in 1511. The large roofless church of St. Paul on the hill overlooking the coast, where the celebrated missionary St. Francis Xavier † was buried before being transferred to Goa, was built by them, also a large series of fortifications, now, alas! no more, thanks to the misplaced energies of an English governor a hundred years ago. The whole of the Portuguese Eastern trade radiated from Malacca, which thus flourished as the most important trade centre in the East for nearly a hundred years. The Portuguese were succeeded by the Dutch, who have left some substantial buildings, chief of which is the old Stadt House, still used as Government offices, and the large church at the foot of the hill near the landing-place. After nearly two hundred years of constant rivalry for the trade of the East, Malacca was taken by the English in 1795, and the Dutch were turned out. Sixteen years later a large expedition under Lord Minto was despatched from Malacca to Java, resulting in the occupation of that country by the English, with Stamford Raffles as Governor, only to give place again to the Dutch five years later in 1816. But Malacca remained ours, and round it neighbouring states have gradually come under British influence year by year, so that the Straits Settlements, the Federated Malay States, and the Protected States in the Malay Peninsula, now form one large tract of country prospering day by day under British control and advice.

From an entomological point of view Malacca has sadly

\* 'The Malay Archipelago,' by A. R. Wallace, 1902 edition, p. 19:—  
 "The old and picturesque town of Malacca is crowded along the banks of the small river, and consists of narrow streets of shops and dwelling-houses, occupied by the descendants of the Portuguese, and by Chinamen. In the suburbs are the houses of the English officials and of a few Portuguese merchants, embedded in groves of palms and fruit trees, whose varied and beautiful foliage furnishes a pleasing relief to the eye, as well as most varied grateful shade. The old fort, the large Government House, and the ruins of a cathedral, attest the former wealth and importance of this place, which was once as much the centre of Eastern trade as Singapore is now."

† He died in December, 1552.



deteriorated since Wallace's day, jungle giving place to rubber everywhere; it is interesting to note that Ayer Panas, a place not far from Malacca, where Wallace spent some time collecting, is now the home of a flourishing rubber company which bears that name. It was at Ayer Panas that Wallace caught the first specimen of the handsome Nymphalid, *Prothoe calydonia*, described by Hewitson. He tells us that it was twelve years before the second specimen (from Borneo) was taken. In Sarawak it is regarded as a great rarity, some half a dozen specimens only having been taken in the last twenty years; it is evidently an "unclean" feeder, as Wallace records its capture "on the dung of some carnivorous animal," and the late Mr. Shelford noted that Sarawak specimens were taken in traps baited with rotten fruit.\*

During my stay in Malacca I wandered out to Saint John's Hill, which lies a short distance to the east of the town; a little jungle path leads up to the top, crowned by an old ruined fort, probably built by the Portuguese some four hundred years ago. Not having a net with me, I made use of the next best thing with me, *viz.* a notebook and pencil, and amused myself for an hour noting the insect life of this sun-lit spot.

I reached the hill about 9.30 on a Sunday morning, and slowly followed the path gently sloping upwards. Almost the first butterfly to be seen was the conspicuous Danaid *D. melanippus hegesippus*, with fore wings reddish and black-veined, hind wings white with black veins. The little *Lycænid* *Nacaduba* sp. (probably *ardates*, Moore), and *Everes argiades*, Pallas, appeared common on the sunny path; I noticed two of the former united in cop. A conspicuous black and white barred *Neptis* (*N. leucothæ*) fluttered boldly ahead of me and alighted on a bush by the side of the path, facing outwards; I notice they invariably do this—*i.e.* fly up to a bush and turn face about before settling, so that they cannot be surprised in the rear. I slowly approached one which stayed on the leaf, actually allowing me to touch its outstretched antennæ before lazily taking flight again, apparently in no way flustered by my attentions. These *Neptis* occasionally rest with wings erect over their head, but more often with wings outspread in the sun. They never seem to exhibit signs of injuries suggesting bird or lizard bites, and their slow, fearless flight seems to imply unpalatable qualities.

The common Eastern Pierine *Terias hecabe* put in an appearance; then the large *Catopsilia pyranthe*, hurrying along as if late for an appointment. *Papilio agamemnon* whirled over head at a tremendous rate, hovered at a flower for a moment,

\* 'A List of the Butterflies of Borneo, with Descriptions of New Species,' by R. Shelford, Journ. Str. Br. Roy. Asiat. Soc., No. 45, 1906, p. 131.

and then off again and out of sight down the hillside; I don't know why he (or she?) was in such a hurry; usually, I think, they are not remarkably fast fliers.

A pretty little purple Lycænid (*Arhopala apidanus*, Cr.) caught my attention in a bush close by, working its hind wings up and down in a manner characteristic of so many tailed Lycænids here. The genus *Arhopala* is confined to Indo-Malaya, where some two hundred different species are recognized; they usually frequent shady jungle, but occasionally catch the eye as they flit across a sunlit patch. Borneo appears to be their headquarters, as no fewer than sixty species are found in that island.

The common *Junonia atlites* was noticed flying over the bushes on the hillside; then a large carpenter-bee (*Xylocopa latipes*) hummed over head, settling clumsily on a flower for a moment. On the top of the hill in the old ruined fort a snake slid stealthily away through the coarse grass. A magnificent view lay before me to the east over long flat paddy fields and jungle to Mount Ophir, some thirty odd miles in the distance. By some this is supposed to be the Mount Ophir of Biblical fame, the source of gold in King Solomon's time; but actual proof is unfortunately wanting, though I understand gold has been worked there on a small scale in recent times. To the west I could see the Malacca hill crowned with the ruined church of St. Paul; while on neighbouring hills or undulating ground to the north one remarked Chinese graveyards, which, as is usual in the East, occupy the best building sites in or near most of the big towns. The inevitable rubber was of course in evidence, small patches being planted at the foot of this hill.

Descending again slowly I noticed a worn female *Catopsilia pyranthe*, chased for a short time by a large *Delias*, apparently *D. hyparete*, who might well be excused for mistaking the worn *Catopsilia* for its own kind. The common brown dragonfly *Neurothemis fluctuans* was in evidence, also a large hornet with brown-banded abdomen, probably *Vespa cineta*, Fab.

A pretty little Lampides (*L. celeno*, Cr.) fluttered into the shelter of the trees as I passed; further on the large Papilio *P. polytes* (a male) flaunted gaily ahead of me, and then one of those pretty dark Euthalias with light blue marginal border to the hind wings. A gorgeous moth, with blue and white markings above and bright yellow abdomen, fluttered slowly out of reach into the dark bushes by the side of the path.

As one returns to Malacca along the well-kept road at the foot of the hill, bordering neat and picturesque Malay houses nestling among cocoanut plantations; and, leaving that, as one comes to the outskirts of the town, heralded by Chinese noises and Chinese smells, all implying peaceful prosperity, it is hard to remember the very different scenes that these same shores have witnessed in the years gone by.

One would like to cherish the consoling thought that, though mere man and his works must ever change for better or for worse, Nature—and as entomologists we should like to say insect life in particular—endures indefinitely; one would like to think that the insects Wallace saw in 1854 were there in Dutch times, were there in the days of the Portuguese, and, in all likelihood, were there before the foundation of Malacca more than five hundred years ago; and with that thought one would like to look forward to further long periods, secure in the knowledge that the insects noted in 1913 will be noted again next year, ten or a hundred years hence.

But, unfortunately, man the vandal and man the lover of Nature cannot exist together in the same place; the former destroyed the old Portuguese fortifications at Malacca in the beginning of the nineteenth century; a hundred years later his successors planted Wallace's collecting ground at Ayer Panas with rubber, and so it goes on, year by year, these historic places become less recognizable, and Nature gives way before the march of our boasted civilization.

It is well that a Society for the encouragement of Nature reserves has been instituted in England; it is by no means too soon to start the same in the East. *Why* should we sit idle, exclaiming piously "*Sic transit gloria mundi*"?

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## "YELLOW IMAGES OF *PIERIS BRASSICÆ*."

By F. W. FROHAWK, M.B.O.U., F.E.S.

In the 22nd number of the 'Internationale Entomologische Zeitschrift,' published at Guben on August 30th, 1913, there is an interesting note under the above heading on p. 151 by Mr. Franz Bandermann, of Halle a/ Saale, which I fancy may be of interest to English entomologists, and of which I append a translation:—

"Many discoveries have been made through chance, and in this way I secured in quite a remarkable way yellow imagines of *Pieris brassicæ* in May of this year. I was examining my boxes of duplicates in which several species were stored. In one of these boxes I had placed six examples of this Pierid which I had taken four days previously from the setting boards. As I noticed some mites moving in the box I killed them with benzine, without, however, touching any of the specimens with the liquid. After a week I wanted to put some more specimens in this box, and when I opened the lid I was much surprised to see some yellow *brassicæ*. At first I could not find my explanation for this change of colour, but soon came to the conclusion that only the yellow paper, which had been used for pasting together



the box, could be the cause of this change. I made an experiment with other imagines, but unfortunately the same result did not follow. All the same I am of the opinion that the vapour of the benzine dissolved the yellow pigment of the paper, and deposited it again on the fresh (*i. e.* recently caught) imagines. Experiments with older examples failed, and they remained white. The yellow examples are in my collection, and were exhibited by me at a meeting of our Entomological Society.

“FRANZ BANDERMANN,

“Halle a/ Saale.”

It is, perhaps, possible that freshly emerged examples of Pieridæ may be tinted yellow by exposing them to the vapour of benzine, the wing membranes containing certain fluids which are not affected by this chemical when they have become hardened.

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## LEPIDOPTERA AT ALBARRACIN IN MAY AND JUNE, 1913.

By W. G. SHELDON, F.E.S.

(PLATE XII.)\*

ALBARRACIN and its sierra are fairly well known to British lepidopterists, several of whom have visited them during the past twenty years; but these visits have been made exclusively in the months of July and August, when certain very local and interesting butterflies are to be found in abundance, and so far as I am aware no one has ever observed the spring and early summer species occurring in this district.

It was this fact that chiefly induced me to undertake an expedition to this most picturesque of Spanish towns last spring. A companion during a somewhat prolonged excursion of this description is a very desirable adjunct, and I was fortunate in persuading my friend Mr. A. H. Jones to accompany me, and all who know the genial Treasurer of the Entomological Society will realize the charm of his companionship and the value of his assistance.

Albarracin is totally unknown to the foreign tourist. Baedeker does not mention it, and except during the months of August and September, when the inhabitants of Valencia and Saragossa visit the sierra in some numbers, attracted by its comparative coolness and by the curing mineral springs which are found in certain parts, the district is left to those who dwell there permanently.

There are nowadays numbers of books written in English on

\* Plate xii. will appear with the November instalment.



various parts of Spain, but I think the bookmaker has rarely if ever visited Albarracin, for the only mention I can find of it in literature is, that the well known writer A. F. Calvert, in one of his books on Spanish cities, writes of Segovia as being, for picturesque and romantic situation, only equalled by Albarracin.

Perhaps it is not very much out of place, even in an entomological article, to outline briefly the story of a town so famous entomologically and historically.

The reason for its foundation was no doubt its possibilities for defence. The River Guadalavivier, rising some considerable distance higher in the sierra, has formed one of the finest gorges I have seen in one particular part of its course; for two miles or so the walls of this cañon rise sheer many hundreds of feet, just affording room for the river to flow between them, and for a modern road to be cut alongside. At the lower end of this cañon the river suddenly makes a great bend, the shape of half of the letter S, almost enclosing a rugged ridge which rises some 150 to 200 ft. above the river; this ridge has in its centre a crag, elevated perhaps 40 ft. above it. On this crag was built the first stronghold, no doubt before historic times. Later the sides of the ridge, and the narrow neck connecting it with the surrounding hills, were fortified with walls, which still in great part remain, and the crag became the citadel. These walls, with their frequent towers, which enclose a spring of excellent water, have the appearance of being erected in Moorish times, say about the year A.D. 1000, and no doubt they constituted in the Middle Ages a very formidable defence. Nothing is known historically of the town before the year A.D. 1020, but it is strongly suspected to have been in pre-Roman times known as Segobriga, and, as such, prominently associated with the Spaniard Viriathus, who about 150 B.C. held the Romans at bay for many years, inflicting repeated defeats upon them. Be this as it may, in the year A.D. 1020 a Moorish chief, Aben Razen, who was lord of the town and district, threw off the yoke of the Central Government at Cordova, and asserted his independence. This chief and his immediate successors seem to have waged war with the neighbouring Emirs of Sagunto, or Murviedro as it was then called, and Denia, and with the Spanish national hero, El Cid Campeador, who at one time was in possession of the town and kingdom of Valencia. El Cid in the height of his prosperity exacted an annual tribute of ten thousand pieces of gold from the Lord of Albarracin, which fact will afford an idea of the considerable extent and value of the possessions of the latter. Towards the end of the twelfth century the Moorish King of Valencia, Mahommed Aben Lahar, in return for assistance rendered to him in war by a Navarrese knight, Pedro Ruiz de Azagra, granted to him the town and territory of Albarracin. The Moorish commander, however, refused to give

up possession, and consequently Azagra was compelled to conquer it.

Upon obtaining possession the new lord declared his independence of the ruling Spanish powers of that period, the Kings of Castile and of Arragon, and he and his successors succeeded in keeping it for several generations. In the thirteenth century the town was besieged by Jaime I., of Arragon, "the Conqueror." The siege lasted for four months, and the assailants were eventually beaten off. Six years later a Mussulman force laid siege to the town without success.

In 1284 it was for the third time besieged, and this time taken by its assailant, Pedro III., of Arragon.

After various vicissitudes Albarracin and its territory was finally, in 1363, peaceably incorporated in the kingdom of Arragon, retaining great privileges, which remain in part even to the present day, for it has jurisdiction over an extent of country 97 kilometres by 61 kilometres; and the community owns a great part of the surrounding forests and mountains.

We were fortunate in making the acquaintance of the cultured Secretary of the Corporation of Albarracin, Don Mariano Rabinad, from whom we experienced great kindness, and who gave us valuable assistance and information in many ways, showing to us, amongst other things, the Municipal records, which are very perfect and voluminous. Those kept at Albarracin date back to 1340. The earlier ones are at Barcelona.

We made enquiries as to the collections of the famous Spanish lepidopterist, Bernardo Zapater, who died at Albarracin a few years ago, and were informed they had been deposited in the museum of the Catholic College.

An examination disclosed that there only remained three small boxes of all orders of insects, which by this time, in consequence of neglect, had resolved themselves almost entirely into dust.

The following is a list of all the articles on the lepidoptera of the district of Albarracin, which I have been able to find in the English magazines:—

"The Butterflies of Arragon," by Mrs. Mary de la B. Nichol, F.E.S.; 'Transactions' of the London Entomological Society for 1897, p. 127.

"A Few Weeks Entomologising in Spain," by T. A. Chapman, M.D., F.Z.S., F.E.S.; 'Entomologists' Record,' xiv. p. 70.

"The Lepidoptera of Central Spanish Sierras," by the present writer; 'Entomologists' Record,' xviii. p. 57.

"*Melitaea desfontainii* and *M. aurinia* var. *iberica* in Central Aragon" by Miss M. E. Fountaine, F.E.S.; 'Entomologist,' xxxix. p. 42.

"A Few Notes on Spanish Butterflies," by A. F. Rosa, M.D.; 'Entomologist,' xli. p. 4.

"In Sunny Spain," by Mrs. Rosa E. Page, B.A.; 'Entomologists' Record,' xxv. p. 33.

On Thursday, May 8th, we left London, and travelling *via* Barcelona and Valencia arrived at Albarracin on the following Tuesday. At Barcelona we stayed two nights, and spent a day on the hill of Tibidabo, where, in 1908, I had found the larvæ of the very fine *Melitaea aurinia* var. *iberica* in great abundance; the imago should have been flying at the time of our visit, but a careful search did not reveal it, and with the exception of a specimen of *Carcharodus baeticus* and some not over good examples of *Melanargia syllius*, we did not see anything worthy of note.

Beyond Barcelona the journey is a very interesting one; the Mediterranean is skirted all the way to Valencia, and the last fifty miles or so the railway passes entirely between orange orchards. Just at the time of our visit many of the trees were laden with golden fruit, and all of them were white with blossom, the perfume from which filled the entire country and was almost overpowering.

A few miles before Valencia is reached the famous old city of Sagunto is passed, the siege of which by Hannibal was the cause of the Second Punic War. At Sagunto the railway branches inland to Tervel, the nearest railhead to Albarracin, passing some very beautiful country and interesting old historical towns. It does not seem, however, very likely ground for butterflies, very few of which were seen *en route*.

At Tervel we stayed one night at the station, where there is now an excellent restaurant and good sleeping accommodation; the next morning we travelled by *diligence*, which takes six hours or so to reach Albarracin, a distance of about twenty-four miles.

On our arrival on May 13th the weather was not settled, and the next morning we awoke to find the ground covered with snow; this, however, melted during the day, and it was the only touch of winter we experienced.

I cannot say that we saw great quantities of lepidoptera; I question whether such are ever seen at Albarracin, which has an altitude of about 4000 ft., so early in the year; but it must be borne in mind that last year was an unfavourable season over wide regions in Europe, and I cannot help thinking that this reason was accountable for, at any rate, some of the scarcity of specimens. Whether it was so or not, it is certain that, with the exception of a very few species, butterflies were scarce throughout the whole of our stay. We gathered from certain residents that the season was quite a fortnight later than the average, and this of course would account for a certain proportion of the scarcity. In any case it prevented us making excursions to the higher parts of the sierra, such as Bronchales, Griegos, Guadalupe, &c., for if species were not out at 4000 ft., they obviously



would not be at 5000 ft. or upwards. As a matter of fact, reports from Broncholes as late as the middle of June spoke of the ground being covered with snow. Under these circumstances the dates on which we found the different species must be qualified for reference by the late season.

The weather generally was, as it usually is in Sunny Spain, magnificent; bright sun from morning until evening on many days, tempered by a most delicious cooling breeze, and there were only one or two days on which our quarry did not fly. There were, however, days during which the temperature in our sitting-room did not reach more than 53° Fahr., and even on June 2nd it did not exceed 55°. A fortnight later there was a week of broken weather, with heavy thunderstorms accompanied by hail, each day.

Arriving on May 13th I had to leave on June 21st. My friend, however, was able to remain at Albarracin until June 30th, and I am indebted to him for kindly allowing me to add to my observations the result of his own, both during my stay and after it had come to an end.

I had expected to see many interesting birds at Albarracin, but in this respect the excursion was somewhat disappointing; it is true the smaller species, such as warblers, chats, buntings, &c., were abundant in the Guadalavie valley; but the Raptores, which from the nature of the country and the sparseness of the population one would expect to be abundant, were remarkably scarce. There was certainly a magnificent red kite which treated us to its peerless aerial evolutions almost daily, a mile or so below the town, doubtless its eyrie was near by; and one day near the village of Moscardon two Egyptian vultures were seen.

Enquiries from Señor Rabinad elicited the fact that the *lämmergeyer* is still occasionally seen in the neighbourhood. Wolves are common in the wilder parts of the sierra, causing great depredations amongst the flocks and herds; and we learned that several cubs were killed during our visit a few miles from Albarracin, near a place we collected over pretty frequently.

The prevailing surface rock at Albarracin is calcareous; this is almost universal in the district, except that on the right bank of the River Guadalavie, immediately below the town and extending some miles back into the hills, there is an outcrop of a silurian formation, surmounted by a very deep red sandstone. On this latter formation at Puerta de la Losilla there is a large pine forest, beneath which is, amongst other plants, an extensive growth of a species of *Vaccinium*, which I think is *V. vitis-idaea*.

The prevailing tree in the calcareous country seemed to me to be a species of *Cupressus*, but Dr. Chapman thinks it is the Savin tree; there are also *Juniperus sabina*, in places, considerable quantities of *Ilex*, and down the Guadalavie



gorge there are here and there a number of ash trees. The undergrowth consists of several species of *Rhamnus*, the curious *Ephedra nebrodensis*, *Pistachia terebinthus*, *Artemisia fruticosa*, and a great number of species of spiny leguminous plants and shrubs; the most singular of these was a shrub entirely without visible stem, and consisting of a bundle of stout spines one or two inches long, between each of which protruded a most lovely mauve, papilionaceous blossom. The whole shrub, which was found chiefly on the summits of the hills, was a mass of brilliant colour. One of the most abundant plants was the common Mediterranean asphodel, which threw up spikes of bloom 3 or 4 ft. high, and which was a very picturesque object. A plant which carpeted the ground in places with its delicate pink blossoms was a small species of *Malva*, beloved of many species of butterflies.

Another brilliant plant which grew in patches here and there was a species of *Linum*, with vivid blue flowers quite an inch in diameter. The flora is strikingly African in character. Springs of water are very infrequent, and except where irrigated the whole region is very dry and sterile.

Our collecting was principally in the Guadalavivier valley or gorge below the town. The first two miles or so of this consist of a wide valley known locally as Valdovecar; the road runs down the centre, and has on the right the river and much fertile irrigated ground. On the left of the road are unenclosed cornfields, which extend up the hillsides at intervals. These cornfields are the haunts of *Zegris eupheme* var. *meridionalis*, *Euchlœa euphenoides*, *Anthocharis belia*, &c. Two kilometres below the town, between the road and the river, was a series of sainfoin fields, which during the earlier period of our visit was a gathering place of almost all the lepidoptera we could find in the district; amongst these were *Zegris* var. *meridionalis*, *Euchlœa euphenoides*, *Agriades thersites*, *Cupido sebrus*, *Lampides boeticus*, *L. telicanus*, and *Nomiades cyllarus*. Below these fields the valley narrows and becomes a gorge, with only just room for the river and the road. In the first two kilometres of this gorge very little is to be found, but after this, at a place called Santa Croche, just where an old castle is seen perched upon a crag on the left, matters improve; and from here onwards for several miles the lower slopes of the gorge and the cross ravines constitute probably the best ground for butterflies in the whole district, and are certainly the headquarters of such local species as *Melitaea desfontainii*, *Rusticus zephyrus* var. *hesperica*, and later in the season *Satyrus priouri*. There is a wide valley leading out of the main valley, the first one on the left below Albarracin, which is known locally as the Vega. In early summer, and later on also, this is good ground; here we first found *Melanargia ines* in some numbers.

We of course made several visits to the hill district on the

right bank of the river, well known to previous visitors, and called Puerta de la Losilla; and one day we took a mule-cart to Moscardon, a village some dozen miles above Albarracin, which is said in Zapater's Catalogue to produce *Erebia erias*; the day was, however, not favourable, with but little sun, and the only species not seen elsewhere was *Anthrocerus rhadamanthus* var. *cingulata*, of which we captured a few examples.

Nowadays there are so many species of lepidoptera which are only recognizable with certainty by an examination of their genitalia, that I felt it necessary to submit specimens of all the species of which there could be any doubt to my friend Mr. A. L. Rayward, who most kindly undertook to make preparations of those organs, and to whom I am greatly indebted for so doing.

(To be continued.)

## NOTES AND OBSERVATIONS.

NOTE ON THE EGG-LAYING OF *HESPERIA SYLVANUS*.—It is stated in 'Butterflies of the British Isles' by South, p. 193, and also in Tutt's 'British Butterflies,' vol. i. p. 136, on the authority of the late Mr. Ullyett, of Folkestone, that the female of this butterfly deposits its eggs within the sheath of a grass-stem. I recently had the opportunity, in Hungary, of watching several examples of this butterfly deposit, and in all cases the egg was laid in exactly the same manner. The butterfly alighted on a blade of grass almost parallel to its longer axis. It then curved its abdomen round beneath the blade and deposited an egg almost in the centre of the blade. Most of the eggs were laid on the lower surface of the grass blade, but a few were placed on the upper surface when the lower surface was the more exposed of the two. Mr. Ullyett's assertion, unquestionably incorrect, is the more remarkable, as he was an extremely accurate observer; and the explanation probably lies in the fact that he mistook a female of *Hesperia thaumas* (*linca*) for this species, as *thaumas* adopts that method of laying its eggs which he describes.—N. CHARLES ROTHSCHILD; Arundel House, Kensington Palace Gardens, W.

*PARNASSIUS APOLLO* IN GERMANY.—"In Deutschland verboten" is a legend not unfamiliar to the tourist surveying the bookstalls of Lucerne and Vienna. But it has now achieved an extended significance, and collectors of palaearctic butterflies will be interested to hear that the capture of *Parnassius apollo* has been forbidden throughout the German Empire by an order of the Government. The order—for information of which I am indebted to M. Charles Oberthür—has not come a day too soon, for the extermination of *Apollo*, already complete in the mountains of Silesia, is threatened elsewhere, despite the independent action of the Bavarian Government to put an end to over-collection of the species in the Bavarian highlands. A close season of a few years for a special butterfly is

an agreeable novelty. It is to be hoped that the German authorities will be more successful in enforcing it than has been the case elsewhere, where attempts have been made by State or Municipality to protect rare flowers and birds.—H. ROWLAND-BROWN; Harrow Weald, September 14th, 1913.

COLIAS EDUSA IN BUCKS.—While collecting on August 15th on the Chiltern Hills, near Princes Risborough, I took a male *Colias edusa*. The day was dull, and there was not a ray of sunshine to induce the flight of butterflies, though a few *Agriades corydon* males were on the wing. Happening to beat a small dwarf conifer, however, I put up this, the only "Clouded Yellow" I had seen in England for five years, with the exception of the female notified by me from Great Missenden last year. Unfortunately, though otherwise perfect with the freshness of a newly-emerged specimen, a large piece had been torn, apparently by a bird, from the right hind wing. I visited the same locality on several occasions during the month, but saw no more of the species. At another spot on the 9th I captured a perfect example of *A. corydon* var. *tithonus*, Meig. (var. *syngrapha*, Kef.), the first I have ever encountered on the Chilterns in some twenty years' collecting hereabouts. *Pamphila comina*, usually very abundant, was conspicuous only by its absence. I saw but one very dark female: possibly the flight was over. I should mention, also, the marked tendency of the "blues" this season, especially of *Polyommatus icarus*, to develop blue forms of the female.—H. ROWLAND-BROWN; Harrow Weald, September 13th, 1913.

COLIAS EDUSA AT EALING.—As I was walking near Ealing Broadway station about mid-day yesterday (August 28th) a specimen of *C. edusa* swooped down over the houses within a few yards of me, and careered away across Haven Green.—W. R. TAYLOR (B.A.).

COLIAS EDUSA IN HAMPSHIRE.—A male specimen of *C. edusa* in fair condition was taken on September 17th in the Public Gardens at Bournemouth.—A. S. CORBET; Bournemouth.

COLIAS EDUSA IN KENT.—Two friends of mine kindly collecting for me on a holiday at Romney, Kent, reported that *C. edusa* was very abundant during the second week in August; among a fine series brought back were two beautiful specimens of var. *helice*. Large numbers of the commoner species were captured, among which I was glad to find one *A. occulia*: is this not a rare insect so far south?—J. B. MANLY; Park View, Henley-in-Arden, Warwickshire, September 14th, 1913.

COLIAS EDUSA AT SOUTH NORWOOD.—Whilst sitting in my back garden on Sunday last, the 24th inst., I observed a fine specimen of *C. edusa* (male) flitting over the flowers.—W. D. COMSDALE; "Sunny Bank," South Norwood, S.E., August 30th, 1913.

COLIAS EDUSA IN SUSSEX.—*C. edusa* has been plentiful in clover fields at Selsey this week, and I have caught some very fine specimens, the females being especially good and in perfect condition. I have also seen one *C. hyale* but failed to net it.—Miss A. D. EDWARDS; Iron Latch Cottage, Selsey, Chichester, August 29th, 1913.



*COLIAS EDUSA*, &c., IN ISLE OF WIGHT.—On Monday, August 25th, at Brooke, near Freshwater, in the Isle of Wight, I captured three *Pyrameis cardui* as well as seeing two others. Numerous male *Colias edusa* were flying as well, and I also netted a good female on the slopes round Carisbrooke.—A. CAPEL MORRIS; Leafield, Gibsons Hill, Norwood, S.E., August 30th, 1913.

*COLIAS EDUSA*, &c., IN ISLE OF WIGHT.—I was staying at Bembridge, Isle of Wight, from August 27th till September 10th, and during the whole of that time I found *C. edusa* quite common in the clover fields, between Bembridge Harbour and Whitecliff Bay. Males were far more numerous than females, but I took one beautiful specimen of the female form *helice*. Many were rather worn, but quite half of those I saw were beautifully fresh, and there is no doubt at all that they were bred on the spot and not immigrants. Very few other butterflies were seen, except *Pyrameis atalanta*, and an occasional *P. cardui* or *Vanessa urticae*.—F. A. OLDAKER; The Red House, Haslemere, September 16th, 1913.

*COLIAS EDUSA* IN WILTSHIRE.—I saw several specimens of *C. edusa* at Pewsey at the end of August. Others were noted throughout September up to date.—(Rev.) C. A. SLADEN; Alton Barnes Rectory, Pewsey, Wilts, September 23th, 1913.

*COLIAS EDUSA* IN YORKSHIRE.—I took *C. edusa* in good condition at Bridlington, September 7th, 1913.—H. DOUGLAS SMART; Shelley, Huddersfield, September 14th, 1913.

LARVÆ OF *TORTRIX PRONUBANA* ON GERANIUM.—I have just read Mr. Claxton's (p. 196) record of *Tortrix pronubana* found feeding on geranium in his greenhouse. It is interesting to hear that this little species has reached Romford. If reference is made to the Entom. Record, vol. 20, p. 213, it will be seen, however, that geranium is not a new food-plant for this omnivorous insect. Perhaps if Mr. Claxton could trace the origin of any geranium cuttings he may have had from the south—or through a florist—he might be able to account for the presence of *T. pronubana* in his greenhouse. The larvæ are particularly fond of making their abode in that end of the stem which is left after the cutting is trimmed for striking. They often feed in considerable numbers in my boxes of geranium cuttings.—FRANK E. LOWE; Guernsey, August 21st, 1913.

*TORTRIX PRONUBANA* AT HARROW.—At dusk on September 16th I took a specimen of this moth on my open window here.—F. W. EDWARDS, Kingswear, Cornwall Road, Harrow.

*ARASCHNIA LEVANA* IN BRITAIN.—I was interested in Mr. H. Rowland-Brown's remarks in the September issue (p. 267) of the 'Entomologist,' and am communicating with him direct, but in case any other reader is interested in this capture I would point out that there is no doubt as to its being *A. levana*, the species being clearly described by W. F. Kirby, F.E.S., in text, and he also gives splendid coloured figures of same, including var. *porina* and *prorsa* (see 'Butterflies and Moths of Europe,' Cassell & Co). This butterfly is also described and figured in 'Beetles, Butterflies, Moths and other Insects,' by A. W. Keppell, F.E.S., and W. Egmont Kirby, but is



there named *Vanessa levana* (the Least Tortoiseshell). I have made careful enquiries around the district where I got this specimen (Forest of Dean) but cannot trace anyone breeding foreign butterflies, so apparently it is the first British caught specimen.—T. BUTT EKINS; Loxbere House, Windsor Terrace, Penarth, September 22nd, 1913.

BIRDS EATING BUTTERFLIES.—During the last two years I have noticed only two instances of birds catching butterflies, though I have kept a sharp look-out for them. In my small garden, of perhaps three-quarters of an acre, I have notes on no fewer than thirty-five species of birds, either in the garden or flying over, such as swifts and swallows. No doubt this large number is due to the fact that my grounds are the most sheltered on the Curragh ridge, and give the birds some protection from the violent winds which blow from the south-west for the greater part of the year. Eight species have nested in the garden, and tasting experiments should, one would think, be fairly in evidence, but I have witnessed none. Of the two instances I am able to give, one was a chaffinch and the other a young robin, both the victims were "whites," *P. brassie* and *P. rapæ* respectively. The chaffinch was driven off, but returned and finished its meal. It is noteworthy that on both occasions it was raining heavily, and both butterflies had been disturbed and were unable to do more than flutter, owing to the downpour. This supports the view held by myself and others that attacks on butterflies are comparatively rare, owing to their being more difficult to capture than other prey. No doubt there are other reasons, one being, as Colonel Yerbury has expressed it, a maximum of wings and a minimum of body. The birds that have nested in the garden comprise the following: Mistle Thrush, Long Thrush, Blackbird, Chaffinch, Robin, Gold Crested Wren, Hedge Accentor, Sparrow.—N. MANDERS (Lt.-Col.); Curragh Camp.

THE BUTTERFLIES OF THE CURRAGH DISTRICT.—The butterflies of the Curragh district are necessarily few in number, but though I was prepared for a paucity of species I was surprised to find that the exertions of two seasons' collecting only produced nineteen, and of these two, *G. rhammi* and *A. paphia*, are represented by single specimens. Butterflies in Ireland are near the western limit of their distribution; but the chief impediment to their greater numbers, both in species and individuals, is, doubtless, to be found in adverse climatic conditions. Ireland is notoriously a wet district, but so far as my experience goes, and it is almost confined to the Curragh, it is not so much the rainfall as the extraordinary number of dull, cloudy days, often without rain, which follow each other with the most distressing regularity. While England was enjoying uninterrupted sunshine in June and July, Ireland, or at any rate this part of it, was lying under a dense atmosphere of persistent cloud, which lasted week after week with, consequently, an almost total absence of butterfly and other insect life, and it was not until July was well advanced and in August that we had real summer weather. Last year was a contrast to this; then we had a fine spring and no summer: this year we have had a very wet spring and a late warm summer, and the effect on the emergence of the spring butterflies

was remarkable, as the following dates indicate. *P. rapæ*, April 10th, 1912; May 17th, 1913. *P. egeria*, April 16th 1912; May 15th, 1913. But the emergence of the summer butterflies was not delayed, as for instance, *C. typhon*, July 1st, 1912; July 1st, 1913. *A. aglaia*, July 14th, 1912; July 12th, 1913. I have regarded as the Curragh district the country for about five miles round the barracks, which I may say are built on an exposed ridge, running due east and west, and surrounded on all sides by an undulating grassy plain, which is used by the troops. With the exception of a few small isolated hills, the country for several miles round is perfectly flat and, no doubt, at one time was an extensive morass; a great number of the bogs have been drained, but there is a good deal of bog still remaining in the near neighbourhood. About two miles east of the Curragh is a small stretch of broken, hilly country covered with furze and bracken, and on the top is a venerable earth-work, known as Knockaulin, covering some acres, and a relic of the far-off days when the native Irish were defending themselves from the incursions of the Danes. This is the best locality, and it was here that I found *M. aurinia* particularly abundant. This, with *C. typhon* and *P. icarus*, is the most interesting butterfly I met with, and from a batch of larvæ found on Knockaulin I bred a series which comprised all the described Irish forms, and not a few of the English. Of *C. typhon* I only caught two last year and a dozen this, all I saw on the one favourable day and in the same acre of bog. They are likewise an interesting lot, as they seem to me to represent not only the Irish but also all the British forms, which is curious in such a small number. To one brought up in the Darwinian tradition it is puzzling how they were ever considered to be anything more than one variable species. The females of *P. icarus* vary greatly, and the cause of it is difficult to trace. Last year was extremely wet, and they nearly all approximated to the usual form found in England, by the restriction of the blue scaling to the base of the wings; this year, which has been fine and decidedly warmer, the blue has largely predominated, and in many all four wings are entirely blue, with the exception of a brown edge to the forewings and red lunules to the hind wings. These are particularly handsome. The following is a complete list of the butterflies seen or captured: *P. brassicae*, common; *P. rapæ*, abundant this year; *P. napi*, abundant, the summer brood is remarkably fine; *E. cardamines*, abundant; *L. sinapis*, locally common in many places; *G. rhamni*, one only; *V. urticae*, common this year; *V. io*, three only seen; *A. paphia*, one only; *A. aglaia*, locally common; *M. aurinia*, locally abundant; *L. egeria*, very common everywhere; *L. Megera*, common; *H. inaria*, abundant; *H. hyperanthus*, very common; *C. typhon*, scarce; *C. pamphilus*, common; *C. phleas*, not common; *P. icarus*, common where found.—N. MANDERS (Lt.-Col.); Curragh, Co. Kildare.

NOTE ON APLECTA ADVENA.—There seems to be a considerable difference of opinion amongst the authorities regarding the life-history of this moth. Edward Newman says the larva is "full-fed at the beginning of September." Meyrick gives the life of the larva August to April. Another book in my possession corroborates Meyrick. South says the larva feeds "from July to September," and adds that

"in confinement the moth sometimes emerges in the autumn." L. W. Newman, in the useful work he has just published, gives *advena* as a larva in August and September, and as a pupa from October to May. As this moth comes fairly freely to sugar in my own garden, I have tried breeding it several times. When about two-thirds grown I have always found the larvæ show a strong desire to hibernate, and on one occasion I placed a number of larvæ in the open, caged on turf in which dandelion, plantain, &c., were growing. They disappeared during the winter, but they showed themselves again about March, seemed quite lively and vigorous, and nibbled grass and the young dandelion shoots; but though I tried them with a variety of other food, I apparently did not strike the right one for their spring consumption, and they all died off one by one. This goes to prove that Meyrick is right, and that *advena* does the same as its near relatives, *tincta* and *nebulosa*, and hibernates as a larva under natural conditions. It would be interesting to have the experiences of other observers. While on the subject of the *Aplectas*, I may perhaps record a rather curious point in connection with *tincta*. Once I happened to be near a favourite haunt of the species on a very warm evening very early in the year, and, to see if *tincta* larvæ moved so early, I examined the birch bushes, where I found plenty of the larvæ in their last skins but one. I took some, but though they ate the food I gave them and changed their last skins, they did no good at all, and were easily passed by some larvæ I took some three or four weeks later at the same spot, which fed up and pupated as easily as possible, as I have found they always do when taken in their last skins. The question is, What was the special food or condition the larvæ required in their last instar but one? Also, was it the same want that killed the *advena* larvæ I hibernated?—C. RIPPON; Springfield House, Abingdon-on-Thames.

## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 26th.*—Mr. A. E. Tonge, President, in the chair.—Mr. Main exhibited pupa and living larva of *Parnassius apollo* and the larva of the tiger-beetle, *Cicindela sylvatica*, from near Meiringen, Switzerland.—Mr. Coxhead, galls on leaves of beech, and coloured drawings of the same. They were of the Cecidomyid, *Mikiola fagi*.—Mr. A. E. Gibbs, a series of *Euchloë cardamines*, from near Messina, Sicily, and pointed out that they were small compared with average British specimens, and were known as *turritis*, in which the apical blotch is not extended beyond the discal spot. Mr. Main said that *Phyllotoma aceris*, the jumping sawfly, was now common in many places in the larval state.—Messrs. Sich, Adkin, Edwards, Barrett, and Dr. Chapman made remarks on the season.

*July 10th.*—Mr. A. E. Tonge, President, in the chair.—Mr. Main, a species of tick from a tortoise of Moroccan origin; the males were small and blackish in colour, while the female was many times larger, and of a delicate pale slate-colour; and cases of the Psychid,



*Acanthopsyche opacella*.—Mr. Adkin, series of *Celastrina argiolus*, (a) reared in July and August, 1912 and (b) reared in April and May, 1913, from the same lot of larvæ from Eynsford; (c) reared from Eastbourne larvæ in April and May, 1913. The two spring series were much alike, and the females had much less of the heavy bordering of the summer emergence. —Mr. Edwards, several species of *Papilio* of the *ageus* group from the Australian region, including the rare *P. gambrius*. —Mr. Blair, a nest of the wasp *Polistes gallica*, from Meiringen, with the living female. —Mr. Turner, for Mr. Carr, a bred *Cerostoma scabrella*. —Mr. Barrett and others remarked on the comparative sizes of the captures of other seasons with the present. Some members considered that imagines were smaller this year, while others thought that they were quite up to the average size.

July 24th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Edwards exhibited a pair of the Erycinid *Staluchtis evelina*, from the Lower Amazons. —Mr. Adkin, *Borkausenia pseudospretella*, bred from hare's hair. —Mr. West, a series of the Coleopteron *Anobium paniceum*, found destroying tobacco leaves, by Mr. Adkin. —Mr. Curwen, some fifteen examples of *Polyommatus icarus*, from near Dorking, showing much variation in the spotting and coalescence of the spots on the under surface. —Mr. Hugh Main, parasites of the larva of *Orygia antiqua* and the larva of the large water-beetle *Hydrophilus piceus*. —Mr. Ashdown, the larva of *Hyles euphorbie*, from Switzerland. —Mr. Barrett read a note on the migration of the butterflies *Aporia crategi* and *Pieris brassicae* in Sicily. —Mr. Sich exhibited the cocoon of *Nepticula viminetella*.

August 14th.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Adkin, a series of *Spilosoma urticae*, reared from larvæ taken at Eastbourne in the autumn of 1912. —Mr. Edwards, varied examples of the African *Hamanumida dedalus*, pointing out the extreme response of the under side markings to the environment; the fungi *Polyporus hispidus* on an apple-tree, and *Polystictus abietinus* from a fence; and the pupa of *Tipula oleracea*, the common "daddy-longlegs." —Mr. Barrett, Sicilian and Swiss *Satyrus hermione*, the former the larger; *Raywardia telicanus* and *Lampides berticus*, from Sicily; and the pupæ of *Nonagria sparganii* and *N. typhae* in situ, head upwards in the former, downward in the latter. —Mr. Dennis, a gall on plantain, caused by *Tortrix icterana*. —Mr. Curwen said that *Colias edusa* was common at Mickleham on August 10th, and also specimens of *Nisoniades tages* were obtained on the same date.

August 28th.—Mr. B. H. Smith, B.A., F.E.S., Vice-President, in the chair.—Mr. Main exhibited the living imago of an ant-lion, which he had bred from a larva obtained in Switzerland in June last. It was a female, and while held would feed on flies presented to it. —Mr. West, the Orthoptera *Thamnotrizon cinereus* and *Forficula auricularia* var. *forcipata*, from Dartford, and on behalf of Mr. Carr, the rare Coleopteron *Trichius fasciatus*, from Mid-Wales. —Mr. Adkin, a specimen of *Agrotis exclamationis*, from Lewisham, in which the reniform and orbicular stigmata were united. —Mr. Dunster, *Colias edusa*, from Lyme Regis, *P. atalanta*, *P. cardui*, and *V. io*, from Crewkerne, with *Epione apiciaria*, *Mesoleuca ocellata*, &c., from the same locality. —Mr. Curwen, series of *Polyommatus escheri*



and *Lycæna sephyrus* var. *lycidas*, from Switzerland.—Mr. Carr, ova of *Boarmia gemmaria*, deposited in a box among ova of one of the "thorns."—Mr. Turner, specimens of the Coleopteron *Cetonia aurata*, from Cortina; bred *Cassida viridis* (?) from larvæ on a *Salvia* near König See, Bavaria; and a nest of a wasp, taken from a wall on the road leading from Cortina to Pieve di Cadore.—Mr. Sieh reported the occurrence of a Tineid, *Tincola biselliella*, in some numbers, in the Indian rat-snake's den at the Zoological Gardens.—Mr. Step read a communication, describing how wasps (*Vespa germanica*) deliberately cut holes through tennis netting which had impeded the direct road to their nest in his garden.—H. J. TURNER, *Hon. Rep. Secretary*.

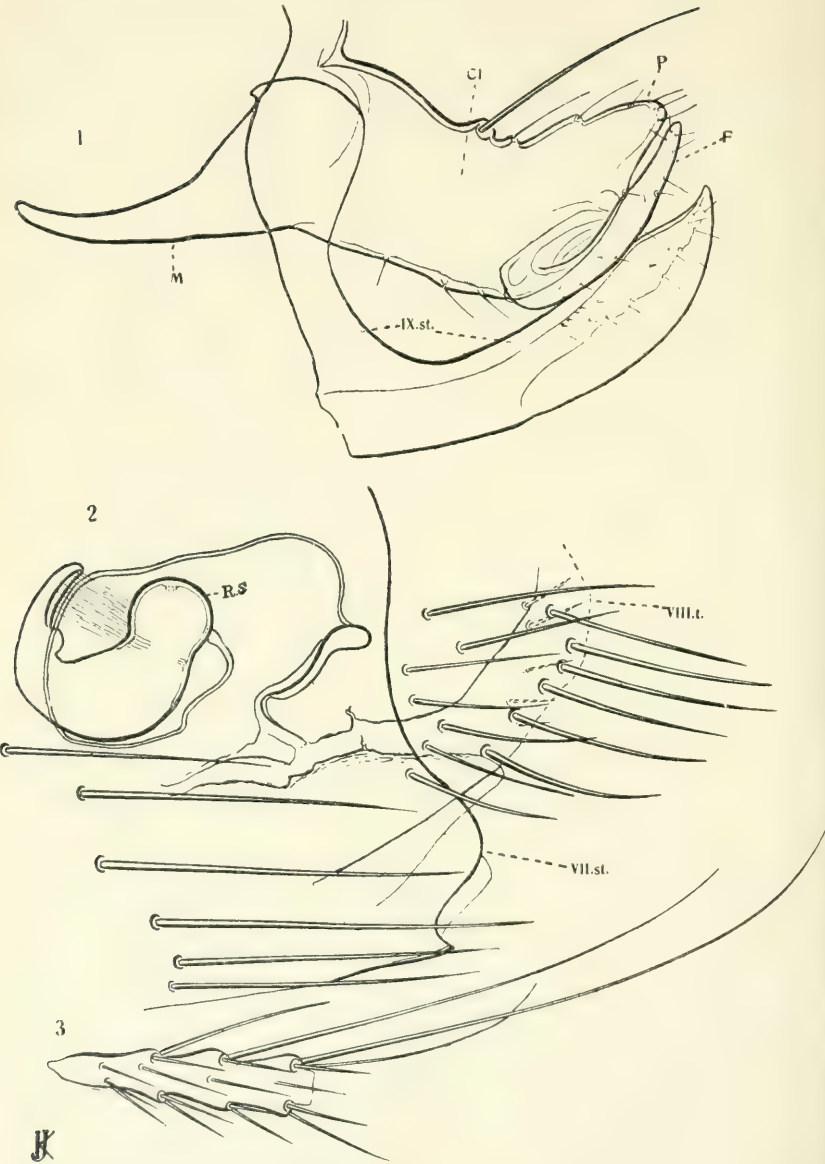
## OBITUARY.

### ODO MORANNAL REUTER.

THERE died, on September 2nd last, in Finland, Professor Odo Morannal Reuter, of the Finnish University of Helsingfors, who, among many other distinctions as an entomologist of the first rank, was one of the twelve Honorary Fellows of the Entomological Society of London, to which he was elected in 1906. Born at Abo sixty-three years ago, it was there that he passed the last years of his life and eventually died. But, though blind for the past five years, he never ceased to work at his favourite science, and the writer of this note well remembers the courageous and hopeful letter he addressed to his colleagues when he recognized that blindness was inevitable. As Emeritus Professor of Zoology at Helsingfors, and a linguist proficient in all the tongues of Northern Europe, including English, hardly a year passed between 1870 and 1910 without some contribution from his laboratory to our knowledge of the less studied groups of insects. Articles upon Hemiptera-Heteroptera, Thysanoptera, and Collembola, filling as *separata* five pages of the Catalogue of the Entomological Society's Library, testify to the fertility of his genius and the diligence of his pen. He was also an accepted authority upon Economic Entomology, and published in Helsingfors, Stockholm, and Berlin many "popular" books devoted to animal psychology which enjoy a wide circulation. The last work of this kind, says a correspondent of the 'Morning Post' (writing from Abo on September 4th), deals with the habits and instincts of solitary insects, and of this German and Finnish editions are in the press, with possibly an English edition to follow. But, though entomology was the dominant inspiration of his activities, Professor Reuter, like the late W. F. Kirby, gave considerable attention to the folk-lore and literature of Finland, using the tongue spoken by him in conversation, which was Swedish. Indeed, a poet himself, it would not be saying too much to describe him as the Fabre of the North, gifted alike with exceptional powers of observation and insight, and with the language of a seer with which to adorn his thoughts and mental speculations.

H. R.-B.

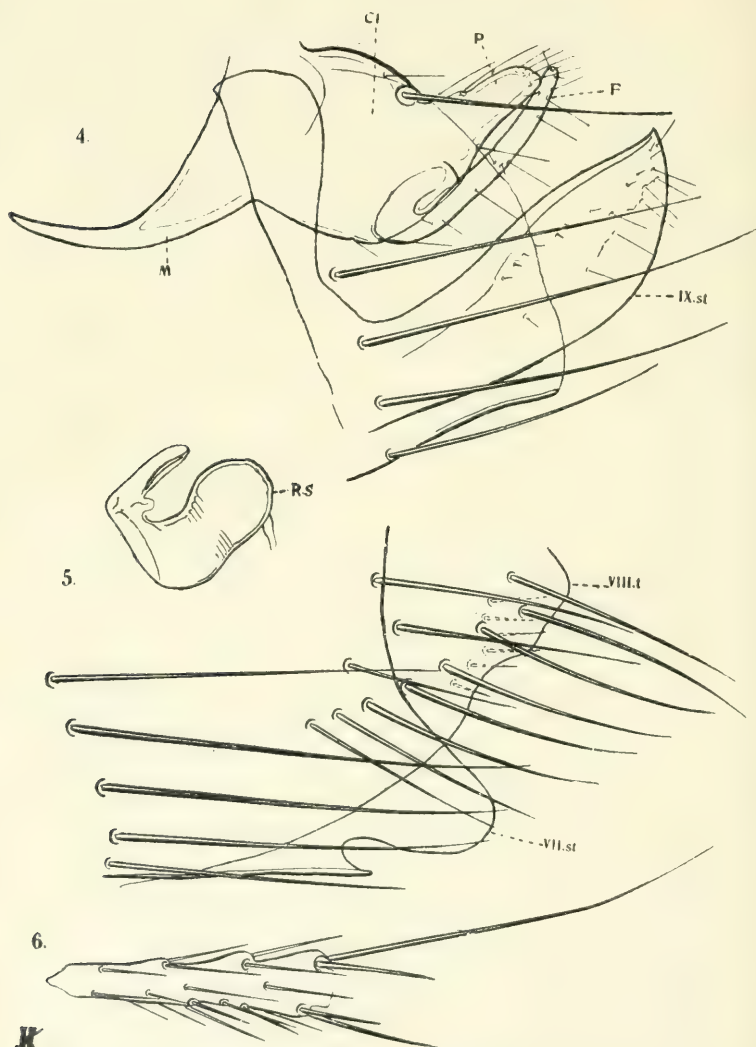




*RHADINOPSYLLA BIVIRGIS*, N. SP.







*RHADINOPSYLLA CEDESTIS*, N. SP.

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## TWO NEW PALÆARCTIC SPECIES OF *RHADINOPSYLLA*, A GENUS OF SIPHONAPTERA.

BY THE HON. N. CHARLES ROTHSCHILD, M.A.

(PLATES XIII. & XIV.)

IN 'Novitates Zoologicæ,' xix. p. 367 (1912), Dr. Jordan and myself proposed the new genus *Rhadinopsylla* for *R. masculana* and allied species, all of which have a genal comb of five spines. Besides *masculana*, *pentacanthus*, and *isacanthus*, mentioned in the place quoted, we now also refer to *Rhadinopsylla* the species described as *Typhlopsylla altaica*, Wagn. (1900), from the Altai Mountains; *Typhlopsylla fraterna*, Baker (1895), from South Dakota (U.S.A.); and the two new species described hereafter.

One of the two new species renders a slight emendation of the original diagnosis of the genus necessary. We described the fifth hind tarsal segment as bearing four pairs of lateral bristles. This is not the case in all the species, the second new species described below having five pairs.

Dr. A. C. Oudemans, in Entom. Bericht. p. 340 (1913), says that the labial palpus of *R. pentacanthus* consists of four segments. The statement is erroneous. There are five segments, as mentioned in our description of the genus.

### 1. *Rhadinopsylla bivirgis*, n. sp. (Pl. xiii., figs. 1, 2, 3.)

♂ ♀. The head agrees closely with that of *R. masculana*, Jord. & Roths. (1912), from Algeria, the frons being strongly angulate a short distance from the palpi in both species. The pronotum of *R. bivirgis* bears a comb of sixteen or seventeen spines and a row of ten bristles (on the two sides together). The metepimerum has five bristles (3, 2), the stigma being placed above the upper bristle of the second row. The abdominal tergites bear a row of ten or eleven bristles, and the sternites of III. to VI. seven or eight bristles on the two sides together. The antepygidial bristles of the female are much shorter, but somewhat thicker, than the lower bristle of the row on the seventh tergite. The bristles of the legs present some characters absent from all the other known species. The longest apical bristle of the hind tibia does not extend to the tip of the first tarsal segment. The first hind tarsal segment has on the hinder side two or three deep

notches, each bearing a pair of bristles, and these pairs are of about the same length, and either equal the longest apical hind tarsal bristle, or, if the latter bristle is much prolonged, are shorter than it. The second hind tarsal segment (fig. 3, male) has on the hinder side one pair of bristles besides the apical pair. The longer bristle of both pairs is prolonged, the long subapical bristle reaching in the male almost to the apex of segment five, and in the female not quite to the apex of segment three, and the longer apical bristle of the second segment extending in the male far beyond the claws, and in the female to the base of segment five. This last segment bears in all the tarsi four pairs of lateral bristles.

*Modified segments.*—♂. The clasping organs very closely resemble those of *R. masculana*, but the clasper (fig. 1, Cl) is much more bent upwards in its distal half, the long bristle placed at its dorsal edge has a much more proximal position; and the distance from the base of the movable process F to the base of the manubrium is longer than the breadth of the clasper. The "finger" F, which is rather strongly curved proximally, does not quite reach to the tip of the clasper and about equals in length its distance from the base of the manubrium. The apex of the inner arm of the ninth sternite (ix. st.) is broad and rounded, with the anterior angle produced into a short beak. The ventral arm (measured along the ventral margin) is distinctly longer than the vertical one. It is canoe-shaped, and bears a number of minute bristles, as shown in fig. 1.

♀. The seventh sternite bears a single row of twelve bristles on the two sides together, and its apical margin has a small rounded subventral sinus, above which there is a short rounded lobe (fig. 2, vii. st.) variable in size. The eighth tergite has three or four long bristles below the stigma, a row of seven near the apical margin, and seven or eight more proximally to this row. On the inner surface the segment bears five short stout bristles. The outline of the apical edge of the segment is rather obscured in the example from which the figure is taken. The head of the receptaculum seminis (r. s.) is quite short and hardly at all separated from the tail, the latter narrowing strongly apically, and bearing on the dorsal side a hump at the beginning of the narrow portion.

One male and two females from Burkhan, near Djarkent, Semitchenskoi, East Turkestan, off white weasel, February 15th and 19th, 1912 (W. Rückbeil).

## 2. *Rhadinopsylla cedestis*, n. sp. (Pl. xiv., figs. 4, 5, 6.)

♂ ♀. Although closely resembling *R. bivirgis*, the present species appears to be perfectly distinct, differing essentially in the tarsi and the modified abdominal segments. In contradistinction from all the other known species of *Rhadinopsylla*, the present form has five pairs of lateral bristles on the fifth segment of all the tarsi in both sexes, one mid tarsus in the male having six bristles on one side and five on the other. The longest apical bristle of the hind tibia reaches beyond the apex of the first tarsal segment. The hind tarsal bristles are different in length from those of *R. bivirgis*; on the first segment

only the apical and subapical bristles are prolonged, on the second only the apical one (fig. 6, male), both bristles of the subapical pair being short, the long apical bristle of the male moreover not reaching beyond the claw.

*Modified segments.*—♂. The body of the clasper (fig. 4, Cl) is much shorter than in *R. bivirgis*, the manubrium (M) much more directed downward, and the process P of the clasper as well as the movable process F are slenderer. Process F is much longer than its distance from the manubrium. The horizontal arm of the ninth sternite (ix. st.) is broader than in *R. bivirgis*.

♀. The antepygidial bristles are longer than in *R. bivirgis*, and the apical lobe of the seventh sternite (vii. st.) is much more produced than in that species (fig. 5). The eighth tergite (viii. t.) has four bristles below the stigma, the lower one being very long, and a subapical row of eight. Proximally to this row there are from three to five bristles, the segment also bearing a row of five or six bristles on the inner surface. The stylet, as in the preceding species, is almost perfectly cylindrical. The receptaculum seminis (r. s.) closely resembles that of *R. bivirgis*. The wall on the ventral side of the "tail" has partly collapsed in both our mounted specimens, as drawn.

A series of both sexes from Kysyldorygda, near Djarkent, Semitchenskoi, East Turkestan, off *Meriones tamaricinus*, October 5th, 1912 (W. Rückbeil).

## SOME COLEOPTERA FROM CENTRAL AMERICA.

By T. D. A. COCKERELL.

WHEN recently at the U. S. National Museum, I took occasion to work over some Coleoptera from Central America, principally collected by my wife in Guatemala. While doing this I was much indebted to Mr. Herbert S. Barber for his kind assistance. I give here a few notes which may be of interest.

*Brachyacantha bistrripustulata* (Fabr.). — Bocas del Toro, Panama (E. Bethel). As this did not agree very perfectly with Leng's description (Bull. Amer. Mus. Nat. Hist. xxx. p. 296), I took occasion to compare it with authentic specimens, and found that Leng's description was inadequate in regard to the structure of the legs; so much so, that one might be misled into thinking he had a new species. I made an entirely new description from my specimen, and give it here:—

♀. Length,  $3\frac{1}{2}$  mm., broad oval, dorsally shining black, with light orange spots; elytra with small evenly scattered punctures, and between them some excessively minute ones, only visible with a high power of the compound microscope (all this is essentially as in *B. ursina*); thorax similarly sculptured, but the punctures denser in the median field; front of head punctate, and minutely (microscopically) rugulose between the punctures; eyes a fine dark green;



head pale orange, the sides, along the eyes, suffusedly blackened (narrowly above), and the lower margin broadly blackened (especially at sides), except the actual edge, which is reddish; thorax with large oblique subquadrate reddish orange lateral areas, making the broad median black region constricted in the middle; elytra with no humeral spot; the three orange spots on each very large, the subapical one suboval, pointed laterad, narrowly separated from margin; the discal or subdorsal ones nearly circular, their diameter greater than their distance from the thorax, and much more than twice as great as their distance from the suture; the lateral ones more irregular, smaller than the discal, separated by a fine black line from the margin; legs ferruginous, approximately the basal half of the femora black; spine of anterior tibia long and sharp, nearly as long as diameter of tibia at that point, margin beyond broadly arcuate as in *B. decora*, but with a very distinct though small supplementary tooth as in *B. arizonica*, though not so near to the apex of the tibia; the tibial spine is very straight, not curved as in *B. dentipes*; middle tibia with a small subapical spine. The elytra are considerably shorter than in *B. ursina*.

This Coccinellid is probably of considerable economic importance as a destroyer of Coccidæ.

*Calomicraspis haroldi*, Candèze.—Quirigua, Guatemala (W. P. Cockerell). A very fine species, with the thorax and scutellum green, the elytra red. It is probably quite rare, as it was not represented in the U. S. National Museum.

*Enema endymion*, Chevrolat.—Quirigua (W. P. Cockerell).

*Phileurus didymus* (L.).—Quirigua (W. P. Cockerell).

*Cælosis biloba* (L.).—Quirigua (W. P. Cockerell).

*Hammaticherus mexicanus*, Thoms.—Quirigua (W. P. Cockerell). Apparently new to Guatemala.

*Neleus interstitialis* (Esch.).—Quirigua (W. P. Cockerell). *Neleus*, Kaup, Col. Heft., v. (1869) is preoccupied by *Neleus*, Raf., 1814. The matter has probably been set right by Zang (1905), whose works I do not possess.

*Rhodocanthopus punctatostriatus*, Percheron.—Quirigua (W. P. Cockerell).

*Calopteron bifasciatum*, Gorham.—Quirigua (W. P. Cockerell). Closely resembles a Syntomid moth (*Correbia obtusa*, Druce), also found in Guatemala.

*Epilachna defecta*, Mulsant.—Antigua, Guatemala (W. P. Cockerell).

*Photuris trilineata*, Say.—Quirigua (W. P. Cockerell).

*Ægithus clavicornis*, Quirigua (W. P. Cockerell).

*Mesomphalia* sp.—Several at Puerto Barrios, Guatemala (W. P. Cockerell). A fine dark green species, with two large blood-red spots on each elytron. It probably has been described, but no name could be found for it.

*Morio monilicornis*, Latr. (det. Schwarz).—Quirigua (W. P. Cockerell).

*CICADETTA MONTANA* IN THE NEW FOREST.

BY G. T. LYLE, F.E.S.

WHEN writing "Further Notes on the British Cicada," published in the 'Entomologist' vol. xlv. p. 332, I did not anticipate having anything more to say on this subject, but since then my acquaintance with our Cicada has so greatly improved that I am venturing to send a few more notes, which I hope may not be without interest to some readers.

Walking through the Forest on the morning of May 19th, 1912, I passed the spot where in previous years I have found many nymph cases, but as the earliest date on which I had noted the Cicada before was June 6th, I did not expect to see any sign of it. What was my surprise, therefore, to at once discover three nymphs and five empty cases. Two of the nymphs were resting on dead stalks of dry bracken some few inches above the ground, the third was crawling on the grass, but soon assumed a similar position to the other two; this was at 11.30 a.m., a bright sunny morning. All the nymphs and cases were within a space some two yards square, so I sat down to observe.

At 11.42 I noticed that the thorax was splitting in one case; the emergence was somewhat slow at first; however, the imago gradually worked its way out, at times giving a series of jerks, until it was hanging head downwards with only the anal segments within the case. At 11.59 the insect bent its body upwards, evidently using considerable muscular effort in so doing, until able to clasp the head of the nymph case with its legs. After resting a few moments in this position the abdomen was drawn clear at 12.3 p.m. In colour a pale green with a dark patch on either side of the pronotum and the eyes dark, the newly emerged imago was considerably lighter than the nymph, which was a brownish green. The wings were, of course, immature and had a bluish tint; expansion, however, was rapid, for at 12.12 they were fully grown, though still limp, while at 12.26 they were folded over the back.

In the second nymph the thorax split at 12.5 p.m., the imago had emerged by 12.25, and the wings were fully grown at 12.34; the time taken in emerging being thus almost identical with that occupied in the first case.

While making these notes I was sorry to find that I had accidentally placed my hand on a fourth emerging Cicada, unfortunately injuring it so that, although it completed its emergence, the wings were crippled. Of these four Cicadas which I watched emerge, the first was a male, the second a female, and the other two males. Of the five empty cases found four had contained males and one a female.

At 1.20 I was obliged to leave. None of the Cicadas had

then assumed the mature coloration, although they were much darker than on emergence. The two perfect males were pill-boxed, the female and the crippled male being left behind.

On my return at 2.45 the female had disappeared, but the crippled male was still in the position in which I had left it, no doubt through being unable to fly. This male was now quite mature, and the two males in the pill boxes assumed the mature



Photo G. T. Lyle.

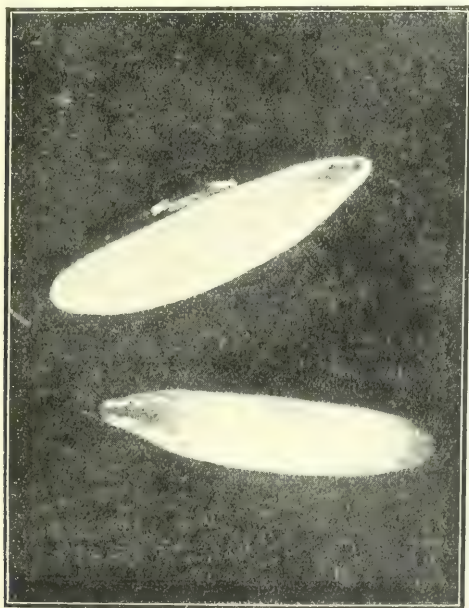
Stalk of bracken (*Pteris aquilina*) containing ova of *Cicadetta montana*.

colours by 2.20. Several Cicadas were "singing" in the neighbouring trees during the whole time I was at the locality. I may mention that the spot where all these Cicadas emerged is within a yard or two of the place where, in 1911, I found so many empty nymph cases.

On May 26th I again visited the Cicada ground and at 11.45 a.m. discovered two females sitting on fronds of bracken;

they were quite mature, and had probably not recently emerged. One of these I disturbed at 12.30, when it flew off with a heavy and somewhat purposeless flight, for after circling round twice it alighted on the turf. Although the insect passed quite close to me, I could not detect the rustling of the wings mentioned by other entomologists. The second was still on the bracken frond at 12.50, but at 1.30 had gone.

About this time I located a male on the branch of a pine tree, being attracted to it by its lusty song. Carefully pulling



Ova of *Cicadetta montana*  $\times 22$ .

Photo G. T. Lyle.

down the branch until the insect was within a foot of my face I watched operations. The bug was resting longways on a twig, singing loudly, the wings, both upper and lower, being quite still, as were all six legs, the only motion I could detect being a very slight dilation of the abdomen when the song, which was intermittent, commenced, and a corresponding contraction when it ceased; the generative organs being also protruded and withdrawn. After a time the insect walked up the twig, and I particularly noticed that the song continued while the Cicada was in motion.

Like the squeak of a bat, it would appear that the note of the Cicada is not audible to everyone, for a friend who was with



me on this occasion was quite unable to detect the sound, although certainly within two feet of the insect.

While searching for nymphs and nymph cases I have several times noticed stems of bracken which have been punctured in a rather peculiar manner, strips of the cuticle having been partly detached, the cavity within containing numbers of ova. Although I have never been successful in rearing the nymph from the few ova which I have removed, and have not been fortunate enough to see the female in the act of ovipositing, there can be little doubt, judging from the habits of nearly allied species, and also from the spot where I have found these ova, that they are the eggs of *C. montana*. The ovipositor must be a powerful instrument to slice the cuticle of the bracken, the method of which the illustration will help to explain (p. 302). Although in the instance figured we have two punctures at a distance of an inch apart, I have often found cases with only one such puncture, and in 1911 noticed a bracken stem with three punctures. Each of these punctures seems to contain some dozen or twenty ova, although I cannot be sure of the exact number, as I have always endeavoured to disturb them as little as possible.

In length the ova reach 2 mm., the medial diameter being but  $\frac{1}{2}$  mm.; they are considerably more pointed at one end than the other, smooth and somewhat shining, and when first laid a pale cream in colour; they rest longways within the bracken stalk, but do not appear to be placed in any particular order. Ova found on June 23rd, 1912, judging from the discoloration of the puncture, had evidently been laid some little time; these ova were still in the same position and unhatched on August 2nd, they then seemed, however, to be slightly darker in colour. Again, on October 6th, I noticed that they were still unhatched, although by this time they had assumed a brownish tint. After this date I was unable to find the nest. Of course, it is possible that these ova were infertile, though they certainly had not that appearance.

There is no doubt that in 1912 *C. montana* was exceptionally plentiful, as, in addition to those already mentioned, I found many other empty nymph cases in the neighbourhood.

In 1913 a careful search on May 18th revealed no trace of the bug, and being away during the following three weeks I could not again visit the locality until June 11th, when at 3.15 p.m. I found a recently emerged female resting just above its nymph case. Although the wings were fully expanded, the mature coloration was not completely assumed until 5.20, when the insect was still in the same position where I left it. Only two other nymph cases were to be found, both of males, and a thorough search a week later did not receive any reward, nor did I on either occasion detect any singing, in spite of the fact that the weather was quite favourable. I may mention, however,

that on June 15th I heard a Cicada singing in a pine tree within a few yards of the spot where, in 1901, I made my first acquaintance with this interesting bug, another proof of how extremely local is the species.

At present the haunt of our Cicada is known to, I believe, only two professional collectors, one woodman, and six or seven entomologists, so that it would seem unnecessary to invoke the assistance of the newly formed "Society for the Promotion of Nature Reserves" for its protection; the time will probably come, however, when it will be found imperative to make some effort to prevent the extermination in the New Forest of this species, as well as the Lepidoptera *Apatura iris* and *Zygana meliloti*.

Brockenhurst: Sept. 17th, 1913.

## SOME DICHRORAMPHAS OBSERVED IN 1913.

BY REV. JOHN W. METCALFE, F.E.S.

BEING in want of several species belonging to this genus for "genitalia" purposes, a careful look-out was kept for them, and the following notes may be of interest. The group to me is a very puzzling one, and it is hard to say exactly how many species we possess. Perhaps Mr. Pierce will be able to tell us when the genitalia have been worked out.

In May *D. saturnana* was flying freely amongst *Tanacetum vulgare* near Ottery St. Mary, indeed it occurs here wherever Tansy is found. The date is perplexing, as Barrett and Meyrick give June and July, Stainton and Wilkinson July and August. The unfolded costa seems clearly to identify the insect and to separate it with *plumbana* from the other *Dichroramphas*. But here, and apparently in the Eastern counties, it flies from the beginning of May and is over by the middle of June, whilst I have seen no sign of a second brood. I have received this insect from friends under the name *tanaceti*, perhaps a guess suggested by the food-plant, the vicinity of which it never leaves. However, it is at least possible that Stainton and Wilkinson were really describing *saturnana* under the name *tanaceti*, and to this the fact that their insect was taken amongst Tansy points. In this case *tanaceti* drops out of our lists. On the other hand, Stainton and Wilkinson, who were, at any rate, dealing with the same insect (*vide* the captor, a Mr. Thompson, near Crewe), may have had *herbosana* before them. In favour of this are the date, the Northern locality, and the fact that they both describe *saturnana* with the unfolded costa elsewhere. In this case we must with Meyrick retain *tanaceti*, St. & Willk., for *herbosana*, Barr.

Of *D. herbosana* I took two specimens at Braemar in early July. This insect I also received from Mr. T. Ashton Lofthouse, taken in the Middlesbrough district in July amongst *Achillea*. The same collector sent me two other insects which, though having a slightly different general appearance, I cannot separate from *herbosana*, and which occur with him amongst *Chrysanthemum* and *Pyrethrum*. Meyrick also gives *Tanacetum* as the food-plant, perhaps on the strength of his identification of this insect with Stainton's *tanaceti*.

*D. sequana* and *D. plumbana* occurred in large numbers near Torquay on June 3rd, flying amongst mixed herbage in the waste corners of a field on the cliffs. The latter seems a very variable insect, but again is easily distinguished by the unfolded costa. Near the same spot an odd specimen of *D. politana* was netted, whilst here and there *D. petiverella* flitted about.

Perhaps the most interesting species met with was *D. seneciana*. It seemed highly probable that it should occur on the cliffs to the east of Sidmouth, and it was a delight, at the second attempt, to turn it up flying freely under the cliff at Weston Bay amongst *Chrysanthemum*. This is a striking insect when set and one easily distinguished.

It remains only to mention one other species, *D. consortana*. This was found in a most romantic spot at the junction of the rivers Garry and Tummel above Pitlochry, N.B. It was flying in great numbers amongst the fading *Chrysanthemum*, but by this date (July 25th) it was unfortunately a little past its prime. The double-brooded *D. acuminatana* has not been noticed here, and the common *D. plumbagana* seems unreasonably scarce, but *D. simpliciana* amongst *Artemisium*, and *D. alpinana* have been taken in other years, leaving only the rare *D. alpestrana* to be met with. However, the above seems a pretty fortunate list of captures in this one genus made during a single summer.

Ottery St. Mary.

## BRITISH NEUROPTERA, 1912.

By W. J. LUCAS, B.A., F.E.S.

NOT many observations in connection with the British Neuroptera have come to hand during the year 1912; but such as they are, they should be put on record, as our knowledge of the distribution of these insects is so meagre.

### Snake-flies.

*Raphidia xanthostigma*, Schum. Tuddenham, Suffolk, June 1st (C. G. Nurse).

*R. maculicollis*, Steph. Goathorn Peninsula, Studland, Dorset, May 25th (J. W. Yerbury).



**Brown Lacewings.**

- Hemerobius pellucidus*, Walk. A nice insect, which seems to be rarely captured. Studland, May 26th (Yerbury).  
*H. micans*, Oliv. Llandrindod, Radnor, August 8th (South); Lelant, Cornwall, August 28th (Yerbury).  
*H. lutescens*, Fab. Studland, May 16th (Yerbury); New Forest, August 2nd (G. T. Lyle); Llandrindod, August 11th-19th (South); Lelant, August 28th (Yerbury).  
*H. orotypus*, Walleng. Stokenchurch, Oxon, August 4th (Yerbury).  
*H. subnebulosus*, Steph. Llandrindod, August 17th (South).  
*H. concinnus*, Steph. Tuddenham, June 11th (Nurse).  
*Micromus variegatus*, Fab. Seashore salt-marsh, Lelant, August 26th (Yerbury).

**Green Lacewings.**

- Chrysopa alba*, Linn. Hurst Hill, New Forest, August 5th; neururation less black than usual (W. J. L.); Llandrindod, August (South).  
*C. tenella*, Sch. Frinton-on-Sea, Essex, July 8th (Yerbury); Walton-on-the-Naze, Essex, salt-marsh, July 9th (Yerbury); Beaulieu River, New Forest, August 6th (W. J. L.).  
*C. vulgaris*, Sch. Frinton-on-Sea, July 22nd (Yerbury); Walton-on-the-Naze, July 23rd (Yerbury); Parkstone, Dorset, at light, September 14th (C. Adams).  
*C. prasina*, Ramb. (= *aspersa*, Wesm.). Frinton-on-Sea, July 22nd (Yerbury); Silverstream, New Forest, August 7th (W. J. L.).  
*C. ventralis*, Curt. Near Newland's Corner, on North Downs, Surrey, July 19th (W. J. L.).  
*C. perla*, Linn. A male and a female taken in Steer Lane, Oxshott, Surrey, June 19th (W. J. L.); eggs laid afterwards in the box in which they were placed.

**Scorpion-flies.**

*Panorpa germanica*, Linn., was first taken on May 12th (a female) between Oxshott and Claygate (W. J. L.). On June 9th, in the same district, they were common, and on June 19th they appeared to be still common in the same place. On June 30th I took it in the Rhinefield district in the New Forest, and Mr. Lyle took it in the Forest on August 2nd. No doubt all these belonged to the early brood. On August 27th, near Palmer's Water, in the New Forest, I took one male and four females on bracken leaves. These must, I feel certain, have belonged to a second brood. They were remarkably fresh with somewhat glossy wings, and the bright spotting gave them quite a distinct appearance. Mr. Porritt took the species on September 9th at Sutton-on-Sea, Lincolnshire. It might seem that the larger species, *P. communis*, Linn., was not in evidence in 1912.

Kingston-on Thames: October, 1913.



TWO NEW VARIETIES OF *PHYCIODES*  
*CAMILLUS*, EDWARDS.

BY T. D. A. COCKERELL.



1

2

*Phyciodes camillus* is common in the mountains near Boulder, Colorado, and among a number of specimens collected we found two very well marked aberrations:—

*Ab. rohweri* (fig. 1). The paler markings on the upper side glistening pearly white, slightly creamy. The black and orange-fulvous normal. North Boulder Creek, Boulder County, Colorado, in the Canadian Zone, August, 1907 (S. A. Rohwer).

*Ab. tristis* (fig. 2). Upper side clouded with black; primaries with a few orange-fulvous marks on basal half, and a large fulvous patch, interrupted by black lines along the veins, on the apical part; secondaries with similar markings. Jim Creek, Boulder County, Colorado, September 7th, 1907 (S. A. Rohwer).

The varietal name must be considered applicable to any similarly melanic form, whether or not it agrees in minute details. An analogous variety of *P. tharos*, Drury, has recently been described by Mrs. W. Reiff as *reaghi*. (Entom. News, xxiv. p. 305.)

Three varieties of *P. camillus* have been previously described as follows:—

*Ab. emissa*, Edwards, 1871. Colorado (Mead). A variety with the black colour reduced.





Photo H. Main.

# FORMS OF DIURNI FROM ALBARRACIN.

- Figs. 1 and 2.—*Aglais urticae* var. *ternelensis*, Albarracin, June, 1913 (bred specimens.)  
 Fig. 3.—*Aglais urticae*, typical specimen, Digne, May, 1903.  
 Fig. 4.—*Epinephele lycaon* ab. *boopis*, Albarracin, July, 1905.  
 Fig. 5.—*E. lycaon*, typical specimen, Digne, July, 1905.  
 Fig. 6.—*Erebia epistygne* var. *viriathus*, male, Albarracin, May 15th, 1913.  
 Fig. 7.—*E. epistygne* var. *viriathus*, female, Albarracin, May 16th, 1913.  
 Fig. 8.—*E. epistygne*, typical specimen, female, Digne, April, 1903.  
 Fig. 9.—*E. epistygne*, typical specimen, male, Digne, April, 1903.

*Ab. pallida*, Edwards, 1864. Texas and Kansas. Another pallid variety, the black mainly confined to the costal region.

*Ab. mata*, Reakirt, 1866. Rocky mountains of Colorado. Light markings more extended; marginal row of lunules on anterior wings complete; the two postdiscal bands continuous, broad, and of equal width.

## LEPIDOPTERA AT ALBARRACIN IN MAY AND JUNE, 1913.

By W. G. SHELDON, F.E.S.

(PLATE XII.)

(Continued from p. 289.)

THE number of species of Rhopalocera met with was seventy-three, as follows:—

*Papilio podalirius* var. *feisthamelii*.—Generally distributed but not common; first seen on May 25th.

*P. machaon*.—A few specimens only seen in the neighbourhood of Santa Croche.

*Thais rumina*.—Zapater says "this species is very scarce"; it certainly is not so now, for it was to be seen everywhere on the dry hillsides, especially at and near Santa Croche, where its foodplant *Aristolochia pistalochia* grew abundantly. The specimens are of full size, but are pale and do not show any tendency towards var. *cantaneri*. The front wings are well blotched with red.

*Aporia crataegi*.—Not uncommon and generally distributed; first seen on May 31st.

*Pieris brassicae* and *P. rapae*.—Generally common.

*Pontia daplidice*.—The first brood of this species, var. *bellidice*, was flying at the commencement of our stay, and a second brood was very abundant in the middle of June. These latter were very fine examples of var. *raphani*.

*Anthocaris belia*.—Was seen flying rapidly over cornfields in May, and an ovum I found on a yellow crucifer produced the summer form var. *ausonia*, after my return to England.

*Euchloë cardamines*.—Common in May.

*E. euphenoides*.—Abundant everywhere, it was the first butterfly I saw on arrival at Albarracin, and it continued in good condition until the middle of June; the males have the orange patch with strongly margined black border to the edge nearest the base of the wings, and in some instances the veins in this patch are covered with black scales also. Some of the females have the apical patch light orange as in Riviera specimens, others are the usual Spanish form, with the orange patch thickly covered with dark scales.

*Zegris eupheme* var. *meridionalis*.—This beautiful species occurred everywhere in cornfields, but was not by any means abundant, or easy to catch, especially the males, which flew very rapidly; consequently our bag was a small one. By working for it one could get three or four specimens in a day, but we usually contented ourselves



by picking up stray ones that came across our path; the specimens do not differ perceptibly from those I have from Granada. We first saw it on May 17th, on which day I captured two males and one female, and from their condition I should say it had then been out several days. It continued in good order until the end of May and I netted one good male on June 13th. The females absolutely refused to part with a single ova, and a search on the yellow crucifers growing in the cornfields for them was not successful.

*Colias hyale*, not very common, first seen on May 26th.

*C. edusa*.—Abundant during the whole period of our stay, successive broods continuously appearing. *Ab. pallida* was not uncommon.

*Rhodocera rhamni* and *R. cleopatra*.—Hibernated specimens of both these species were not uncommon amongst *Rhamnus* in the Guadalavivier gorge.

*Thecla spini*.—Common on the hilltops around Albarracin, and some larvæ I found at Santa Croche, on *Rhamnus licyoides*, produced this species after my return to England; first seen on June 8th.

*Callophrys rubi*.—A few specimens of this species of the var. *fervida* form occurred generally, my examples are in addition all *ab. immaculata*.

*Chrysophanus alciphron* var. *gordius*.—This species according to Zapater is abundant; we, however, did not find it so, and, except for a few examples on the hilltops on June 13th, it was not seen. These examples, which are all males, have a much stronger purple flush than Swiss or French specimens, and come near some *ab. intermedia* from Piedmont, which I have seen.

*C. phloeas*.—Not common.

*Lampides baeticus*.—Certainly the most abundant Lycænid we saw at Albarracin, chiefly frequenting sainfoin fields, where it was in great numbers. Some of the examples were of large size—one of mine expands 42 mm. It occurred continuously during the whole of our stay.

*L. telicanus*.—Frequenting the same localities as the last, but was not common, usually one or two examples were taken each day; first seen on May 25th.

*Scolitantides orion*.—A rather small race, of which the average expanse is about 28 mm., was not very rare in the Guadalavivier gorge near Santa Croche. These examples are mostly var. *ornata*, one or two are, however, quite black = var. *nigra*. I also took one specimen at Puerta de la Losilla; first seen on May 18th.

*S. baton*.—Abundant amongst its foodplant *Thymus*, everywhere on the dry hills at the time of our arrival at Albarracin. The form is entirely var. *panoptes*, without the slightest indication of the red band underneath, which is found in the type.

*Plebeius argus* = *aegon*.—A very interesting and beautiful form occurred in small numbers towards the end of our stay, probably it was not even then fully out. Of the named local races it seems to me to come nearest to the var. *hypochiona* of Rambur. In size the males almost equal var. *bejarensis*, Chapman, expanding 32 mm. and much resemble that form except that the black border on the upper sides

is narrower, the spots on the under side are smaller, and the bases of superiors underneath have more blue scales, the ground colour underneath is equally pure white. My only female is quite without blue on the upper side, the orange lunules are, in this example, continuous on the upper sides of all wings. A most interesting male, taken by Mr. Jones after my departure, has the characteristics of *ab. cascicus*, which, of course, has hitherto only been taken in North-west Spain by Dr. Chapman.

*P. zephyrus* var. *hesperica*.—This species was one of the chief objects of our search, for it is exceptionally rare in our collections; the only examples I know of in Britain are two males in the British Museum, which are labelled "Andalusia," and so far as I am aware it had never been seen alive by any British lepidopterist. It is described in Zapater's Catalogue as rare and local.

My first capture, a quite fresh male, was taken by the side of the road near Santa Croche on May 27th. From this date we searched carefully and widely each day for further specimens, but fruitlessly, until June 5th, on which day Mr. Jones took another male; unfortunately he did not recognize it at the time of capture, so the clue of its locality was lost. However, on June 6th I at length found a very small spot where it was not uncommon, and here on this day I captured fourteen good examples, and others on succeeding days. This locality was a small plateau, perhaps half a mile from the spot where I captured my first specimen, and amongst the hills skirting the left bank of the Guadalavivier. On this plateau grew isolated examples of the savin trees which are the principal timber clothing these hills; the undergrowth consisted of spiny plants, chiefly leguminous, a species of *Malva*, *Asphodel*, and other southern plants, which included a low growing, very hirsute, leguminous plant, with a somewhat inconspicuous light yellow flower, the rather large head of which is borne on a stem two or three inches long. This plant the authorities at Kew have kindly identified for me, it is the *Astragalus aragonensis* of Freyn. On my first visit to this spot, I noticed flying slowly over it, and evidently depositing ova, a female *Lycænid*, which after watching for some time I netted, and found to my great delight was this much desired species. I then searched the plant it had been frequenting and found on it several freshly deposited ova. On a subsequent date I found another locality even smaller than the first, in which a few examples could be found most days; here again the *Astragalus*, which is at Albarracin an exceedingly local plant, grew.

In size my specimens are smaller than those in the National Collection, the largest of which expands 40 mm.; my largest male expands 38 mm., and the largest female 35 mm. The average size of my specimens would be about 3 mm. less than these sizes.

*P. var. hesperica* is excessively local, and only found in the immediate neighbourhood of its food-plant.

*P. astrarche*.—Zapater says this species is very abundant; we did not find it so, though odd specimens were to be taken each day in widely distributed localities after its first appearance on May 21st. The form is a southern one, with well marked orange lunules on all the wings.

*P. icarus*.—Fairly common and widely distributed.

*Agriades thersites*.—Dr. Chapman states in the 'Transactions' of the Entomological Society of London for the year 1912 that he took this rediscovered species at Albarracin, and therefore we kept a sharp look-out for it. As a matter of fact, it was the first *Lycænid* we saw, a female being taken on May 18th flying in a sainfoin field in the Guadalavivier valley, and from that date onwards for about a fortnight a few specimens were taken each day; the condition of these got gradually worse, but in early June there seemed to be another emergence; at any rate, fresh specimens again occurred. With the exception of one or two males found sunning themselves on rocks in a gorge, I did not see this species elsewhere than in the sainfoin fields; it flew with *P. icarus* and was certainly as common as that species. I had three females put up for ova, but unfortunately, though carefully tended and fed, they would not oblige me, though they lived for many days and seemed quite at home amongst the flowers of almost every leguminous plant growing in the district, including, of course, sainfoin, which, from the fact that the females were found only amongst it, I cannot help suspecting would be one of the plants the larva feeds upon.

My series of twelve males and four females varies considerably in size, ranging from 29–39 mm. in expanse. My Albarracin *P. icarus* singularly have a maximum and minimum expanse practically the same.

When one knows the distinguishing characteristics of these species, a glance is sufficient to separate them. In addition to the points of difference given by Dr. Chapman, my specimens have the bases of the superiors underneath with distinctly fewer blue scales in *A. thersites*; the under side of the inferiors in the males is more brown and not so grey, and the orange lunules are more distinct than is the case in *P. icarus*.

All the females of *P. icarus* are ab. *caerulea*, and the whole of the *A. thersites* females are equally blue, though the blue is of a brighter tint, not so purple. Dr. Chapman does not mention this form, for which I propose the name of ab. *azagra*, n. ab.

*A. escheri*.—This species was first seen on June 10th, and was not common at the time of my departure. The specimens do not appear to differ from my French or Swiss examples, except that my solitary female has the orange lunules on the upper side of a brighter and lighter colour.

*A. bellargus*.—Abundant, a very fine form, my largest male expanding 42 mm. as against the 40 mm. expanse of my largest French and 37 mm. largest British examples.

Amongst my series of males are three of what I think is a very rare European form, *i. e.* with orange spots showing on the upper sides of the inferiors. Tutt named this form ab. *rufolineata*, and states that it is found in Algeria and at Gibraltar. I find that there are specimens in the National Collection labelled "Portugal" and "Algiers." Evidently the form is a dry district one.

*A. corydon*.—This species was not out at the date of Mr. Jones's departure from Albarracin, and the only remark I have to make respecting it is with regard to its food-plant. I have sometimes



wondered if the varied coloration of the two local races (vars. *hispana* and *aragonensis*) which occur in the Albarracin district is brought about by different larval pabulum, and therefore it may not be without interest to say that in the headquarters at Albarracin of var. *aragonensis*, *Hippocrepis commosa* is an abundant plant. I did not have an opportunity of visiting the habitat of var. *hispana*, but perhaps some future observer who does so will note if this plant occurs there also.

*A. hylas* var. *nivescens*.—This species was very late in appearing, but Mr. Jones took a very large male expanding 43 mm. at Santa Croche on June 21st, and a second smaller male at Losilla on June 28th.

*Celastrina argiolus*.—Not common; a few specimens only were seen.

(To be continued.)

## NOTES AND OBSERVATIONS.

**TORTRIX PRONUBANA.**—Referring to Mr. Lowe's remarks (*antea*, p. 291), I have had no geraniums from outside sources for several years. I am of opinion that the larva referred to was an escape from a number of larvæ I collected at Bournemouth the previous August, many of which died while quite small in December. My object in writing was to suggest that a proportion of the August larvæ hibernate, producing a Spring brood, which in turn produces the August brood. What the Autumn *moths* do I cannot tell. I have entirely failed to secure a pairing among them. Neither have I ever succeeded in finding either moth or larva in the Spring, except the solitary specimen recorded, which cannot be regarded as normal. It may be that the habits of this species in Britain are different from what they are on the Continent. It would be interesting to know if any British observer, or Mr. Lowe in Guernsey, has carried the species through the cycle of an entire year.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford.

**NOTE ON CUCULLIA LYCHNITIS.**—On July 22nd, 1911, while collecting on a dull day in Oxfordshire I took a few larvæ of *Cucullia verbasci* nearly full-grown on *Verbascum nigrum*, and gathered a supply of the plant for food. The latter I placed in water on arrival home, and on looking at this on July 25th I found eighteen very small larvæ feeding, which I identified some time later as those of *C. lychnitis*. They grew very rapidly, and some idea of this may be gathered from the fact that all had gone down to pupate on August 22nd. The pupæ were kept in a room in which there was no fire during the winter, and the imagines emerged as follows: June 2nd, one; June 3rd, two; June 4th, one; June 6th, four; June 29th, two; July 26th, two; August 3rd, one = thirteen; June 1st, one; July 3rd, one; July 8th, one = three. It will be noticed that only three of the sixteen pupæ passed the second winter in that stage.—H. L. DOLTON; 27, Brunswick Street, Reading, Berks, October 6th, 1913.



MARGARONIA UNIONALIS AT HYTHE, KENT.—I have much pleasure in recording the capture last night of a very beautiful specimen of *M. unionalis*. It was first noted by my father, at rest on the outside of a window here, at 11.5 p.m. He called me, and I opened the window, when the moth flew into the room and was secured.—PERCY RICHARDS; Seabrook, Hythe, Kent, October 28th, 1913.

CYMATOPHORA FLUCTUOSA IN SCOTLAND.—Among a number of insects captured last year by Mr. L. G. Esson in the Isle of Mull are several examples of this moth. The species has not, I believe, been definitely recorded from Scotland before.—N. CHARLES ROTHCHILD; Arundel House, Kensington Palace Gardens, London, W.

UNUSUAL PAIRING OF NOCTUID MOTHS.—Whilst searching for *Luperina cespitis* in Richmond Park on Saturday evening last I was fortunate enough to take a male *Noctua xanthographa* and female *Charæa graminis* in cop. The latter subsequently laid a number of eggs, the rearing of which I intend to take particular care with. Is this not a remarkable occurrence? I should be glad to hear if a hybrid of these two widely-separated species is at present known.—A. E. HODGE; 14, Astonville Street, Southfields, S.W., August 26th, 1913.

ENDOPISA GEMMIFERANA IN DEVON.—When searching on the cliffs east of Sidmouth for a possible locality for *D. senectana*, I was delighted to capture several specimens of *E. gemmiferana*. On that date, June 21st, the insect was beginning to go over, and was not in the best condition. It was flying amongst masses of *Lathyrus sylvestris*, which is probably its food-plant. Hitherto it has, as far as I know, only been taken in the Isle of Wight. As the food-plant occurs all along the cliffs in this locality, it should be found in some numbers another year.—(Rev.) J. W. METCALFE; Ottery St. Mary.

NOTE ON SCOLIOPTERYX LIBATRIX.—While exploring an attic at Fursdon, Thorverton, Devon, I came across seven fine specimens of *Scoliopteryx libatrix* (five males, two females) hibernating in a row on a beam about 2 ft. in length.—W. R. TAYLOR; Jesus College, Cambridge, October 13th, 1913.

NOTES FROM DERBYSHIRE, &c.—Freshly emerged specimens of *Lycæna astrarche* were taken at Dovedale on July 22nd this year. I understand that this butterfly is not common in the locality. I secured a good series. I saw a fresh female specimen of *C. edusa* on September 6th at Leigh, Staffordshire, and a good male on September 8th at Barrow-on-Trent, Derbyshire. I was out shooting on both occasions, so had no net to effect a capture. I am informed that several specimens of *C. edusa* have been seen this year at Barrow while the corn was being cut. Two specimens of *Acherontia atropos* have been taken in Derby during the past month, both of the male sex, and one is in my possession, the other in the Derby Museum.—WINSTON ST. A. ST. JOHN; Derwent House, Derby, October 9th, 1913.

EMMELESIA TENIATA IN WESTMORLAND.—On July 19th last I netted in a wood near Kendal a fine female of *E. teniata*. Mr.

Louis B. Prout kindly identified the specimen, which is generally darker and has the central band broader than the figure in 'Moths of the British Isles.'—FRANK LITTLEWOOD; 22, Highgate, Kendal.

ADDITIONS TO THE GLOUCESTERSHIRE LIST.—On June 28th, 1913, I boxed a male specimen of the Hippopotamus Tortrix (*Epiblema (Ephippiphora) turbidana*) on the bank of the Stroud Canal at Framilode. On July 17th, 1913, I netted a specimen of *Batrachedra pinicolella* in the Forest of Dean. I am indebted to Mr. E. Meyrick, F.E.S., for identifying the specimens. As far as I can ascertain, neither of these species has been hitherto recorded from this county.—C. GRANVILLE CLUTTERBUCK.

COLIAS EDUSA AND SPHINX CONVULVULI IN GLAMORGANSHIRE.—On August 26th, 1913, I took a freshly emerged male specimen of *Colias edusa* in a clover field at Southerndown, near Bridgend, and on the following day my wife saw another on the cliffs there. On September 1st I found a female specimen of *Sphinx convolvuli* at rest on the wooden pailings outside the Earl of Dunraven's park. It was in good condition except for a piece chipped out of one hind wing.—C. GRANVILLE CLUTTERBUCK, F.E.S.; 23, Heathville Road, Gloucester, October 6th, 1913.

COLIAS EDUSA IN KENT.—During the last half of August this year *Colias edusa* was very common. I could easily have caught about three hundred in the lucerne fields. I secured a fine series; amongst them were twelve fine var. *helice*. One specimen, a giant female, had large markings in the black borders, and the ground colour was bright light yellow.—R. H. RATTRAY (Colonel); Tonbridge.

COLIAS EDUSA IN THE CITY.—Whilst standing outside Fishmongers' Hall on September 8th I noticed a specimen of *C. edusa* coming from the direction of King William Street. It flew over London Bridge about 8 to 10 ft. from the ground along the middle of the roadway.—S. WEBB; Dover.

COLIAS EDUSA IN HANTS.—On August 28th last—a hot and sunny day—I saw a specimen of *Colias edusa* flying in the street at Ryde, Isle of Wight, and on September 3rd, a fine, though chilly day in contrast, another was seen at Gosport.—JOSEPH ANDERSON; Chichester, Sussex.

COLIAS EDUSA IN CAMBRIDGESHIRE.—Yesterday a friend, Mr. F. Hardwick, brought me a living specimen of *C. edusa* (male) which he had captured in the Fleam Dykes, near Cambridge, on October 12th. It was in poor condition, and we subsequently released it. May I add a record of *C. edusa* which I nearly captured at Chippenham this year on June 2nd.—W. R. TAYLOR; Jesus College, Cambridge, October 13th, 1913.

COLIAS EDUSA IN SUSSEX.—*Colias edusa* has been very abundant here (Bexhill) this season. I took the first on August 16th, soon after I came here; they were evidently emerging then in the clover

fields. Later, they were everywhere—gardens, fields, roadsides, &c. Curiously enough the first specimen I caught was more or less var. *helice*—a very pale creamy tint. I subsequently caught a dead-white example, and so did my son. I saw no *C. hyale* here. There has been a fair sprinkling of *P. cardui*, and *P. atalanta* is still numerous.—E. A. C. STOWELL; Laleham, Bexhill-on-Sea, October 10th, 1913.

*COLIAS EDUSA* var. *HELICE* IN KENT.—At the end of August, near Dover, my son and I took three *Colias edusa* var. *helice* in good condition, and we saw a fourth.—(Captain) W. E. MANLEY; 62, Albert Hall Mansions, London, S.W., October 13th, 1913.

*COLIAS EDUSA* AT LEWISHAM AND EASTBOURNE.—On the afternoon of October 4th a specimen of *Colias edusa* flitted across my garden at Lewisham and settled on a *Gaillardia* blossom, where I was able to examine it closely, and it proved to be a worn male. I had not seen the species in this neighbourhood since the great “*edusa*” year of 1877. At Eastbourne the species was common throughout August and September, especially about the middle of the latter month, when, in the sheltered nooks on the downs, it was the commonest of the butterflies met with; it was also frequently seen flying along the parades.—R. ADKIN; Lewisham, October, 1913.

*COLIAS EDUSA* IN SUFFOLK.—I took four male *Colias edusa* at Felixstowe on a small patch of lucerne near the beach in the second week in August, and later in the month two male and one female here in Stutton. The latter laid about one hundred and fifty eggs in confinement, from which I have now a healthy lot of larvæ of various sizes.—J. F. LORIMER FISON; Stutton Hall, Suffolk, October 15th, 1913.

*MUTILLA EUROPÆA* IN YORKSHIRE.—When staying at Robin Hood's Bay last September Professor A. G. Green, of the University of Leeds, then spending some time at Scarborough, cycled over to pay me a visit, and while resting for lunch on Low Moor observed a strange-looking insect crawling along the path. The creature was captured and brought to me and recognised as a *Mutilla*, although I was then ignorant of the species. It has since been identified by Professor Poulton as *M. europæa*, and its capture seems worthy of record, because in the prospectus of a book on ‘The Moorlands of North-Eastern Yorkshire,’ by F. Elgee, about to be published at Middlesbrough, a figure of this insect is inserted as the second Yorkshire specimen. If that is really the case, the third Yorkshire example is now in the Hope Museum at Oxford.—R. MELDOLA; 6, Brunswick Square, W.C., October 23rd, 1913.

SETTLING HABIT OF *PYRAMEIS CARDUI*.—The first *Pyrameis cardui* that I noticed here was on June 4th. It was flying round elms in a meadow about six o'clock in the evening. It would often fly down and settle on the ground; but each time that it did so selected a bare, dry patch, and, closing the wings over the body, was almost indistinguishable from the soil on which it rested. I have often observed this habit.—JOSEPH ANDERSON; Chichester.



CYANIRIS ARGIOLUS, A PARTIAL THIRD BROOD.—Between September 29th and October 18th thirteen specimens of *Cyaniris argiolus*, four males and nine females, have emerged from pupæ resulting from some forty larvæ collected from the flower buds of ivy at Eastbourne on September 5th last. Although a third emergence of *C. argiolus* may not be altogether unknown, it is at least very infrequent, and the interesting point in this instance is that, although the majority of females follow the spring emergence in that they have comparatively narrow borders to the fore-wings, some of them resemble the summer emergence in having the wings broadly black bordered.—R. ADKIN; Lewisham, October, 1913.

EUCHLOË CARDAMINES EMERGING IN OCTOBER.—I have the pleasure of bringing to your notice a very late emergence of *E. cardamines*. I found a very small male in the breeding cage on the morning of October 2nd. All the other imagines from the same brood of larvæ had emerged between April 24th and June 9th.—B. W. NEAVE; Lyndhurst, 95, Queen's Road, Brownswood Park, N., October 20th, 1913.

NOTES ON GONEPTERYX RHAMNI, &C.—During the last week in September I was watching some *P. atalanta* on a clump of Michaelmas Daisies, when I observed a female *G. rhamni*, which was also on the flowers, suddenly flutter up to a creeper on the house wall (a yellow summer-flowering Jasmine), and settle on the under side of a leaf. This was about 3 p.m. on a sunny day. The butterfly never stirred for a fortnight, though we had some even warmer days when the sun actually shone upon it. It had evidently gone into hibernation. I watched it every day, for it was clearly in sight at a height of about 10 ft. from the ground, though it required two or three minutes' search to locate it, as its pale whitey-green colouring seemed to disappear among the pale jasmine leaves. I had hoped to watch it through the winter, but unfortunately a squally evening and tempestuous night on October 8th apparently dislodged it from its exposed perch, and I have not found it again as yet. The interesting feature to me was the apparently casual and unpremeditated way in which it took up its winter quarters; there was no search or selection of a site. Yet it would not move again, though the sun actually shone upon it. Three *Vanessa urticae* evidently retired for the winter about the same time, though one was tempted out once more on a very fine day. But *P. atalanta* have obviously no inclination that way, as my batch were all out to-day (October 10th) battling with a very chill east wind.—E. A. C. STOWELL; Laleham, Bexhill-on-Sea.

NOTES ON THE PAST SEASON.—I spent the months of May and June at Margate, and kept a sharp look-out for the arrival of immigrant species. On June 2nd I found that *Colias edusa*, *Pyrameis cardui*, *P. atalanta* and *Plusia gamma* appeared simultaneously in a locality, where, for some days previously I had been taking *Acontia luctuosa* and *Aspilotes citraria*. Butterflies were very scarce! Expeditions to Blean Woods, near Herne Bay, and Sturry Woods, near Canterbury, only resulted in the taking of *Argynnis euphrosyne*, *Callophrys (Thecla) rubi* and *Cyaniris (Lycæna) argiolus*.



At Sturry I caught several *Lithosia aureola*, with the usual common wood-frequenting Geometræ. At the Margate lamps *Neurisa saponaria*, *Melanippe galiata*, *Hemorphila abruptaria* and other species occurred, and I noticed that my son had caught specimens of *Ennomos autumnaria* and *E. fuscantaria* in the same positions in the preceding autumn. A visit to my old collecting grounds at Chinnor at the very end of June found insects still scarce. However, I took *Lycæna minima*, *Parasemia plantaginis* and *Ino geryon*, but their flight was apparently nearly over. Later, my son paid two visits there and found *Hesperia comma* in its old haunts at Chinnor, and *Lycæna corydon* in abundance at Princes Risborough. On arriving at our home in Cornwall I began to look up *Lycæna ægon*, which is the most interesting West Cornwall butterfly. The varieties of the females are almost protean, very dusty black, resembling *L. minima*, and many blue mottled forms, in some the blue colouring extending over almost the whole of the upper wings. A very fine male specimen of *Chrysophanus phleas* var. *radiata* was secured, as well as three good bleached forms of *Epinephele ianira*, and one *Pararge megæra* with one hind wing mostly white, owing to absence of pigment. Larvæ of *Eupithecia pulchellata* in foxgloves and *Dianthæcia nana* and *D. capsicola* in *Silene* were common. At the end of September *Agrotis suffusa* and *A. saucia*, *Epunda nigra* and *E. lichenea*, were plentiful at sugar, as well as a specimen each of *Pernoptilota fluviala* and *Xylina petrificata*.—A. P. SPILLER; Chinnor, Oxon, October 20th, 1913.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 7th, 1913.*—Mr. G. T. Bethune-Baker, F.L.S., President, in the chair.—Mr. Charles C. Best-Gardner, of Rookwood, Neath, Glamorgan, was elected a Fellow of the Society.—The President announced the death of Mr. Herbert Druce, F.L.S.—Commander J. J. Walker exhibited a series of *Acalyptus carpini*, Fr., var. *rufipennis*, Gyll., a rare weevil, taken on and about a sallow-bush at Weston-on-the-Green, Oxon, in April, 1913.—The Hon. N. Charles Rothschild, an example of *Taniocampa gracilis* captured in April this year at Wood Walton Fen, Hunts. The specimen in question is white all over, without any markings whatever.—Mr. Donisthorpe, a form of *Lasius affinis*, Schenck, an ant new to Britain, of which he had found a colony at Tenby, in South Wales, on the sandhills, on April 24th this year.—Mr. H. Eltringham, a number of the scales composing the anal tuft of *Cnethocampa pityocampa*, Schiff., remarkable as being the largest scales known in any Lepidopterous insect.—Prof. Poulton, four males and six females of *Papilio polytes*, L., captured March 10th–October 10th, 1912, by Capt. R. A. Craig, on Stonecutters' Island, in Hong Kong harbour, about one mile from the mainland. All the females were of the male-like form *cyrus*, Hübn. (= *pammon*, L.).—Prof. Poulton read extracts from letters received from Dr. G. D. H. Carpenter, telling of his success in obtaining, for the first time,

fertile ova from a *planemoides* female of *P. dardanus*. Three *planemoides* and seven *hippocoon* females had been bred from the eggs laid by the Bugalla parent.—Mr. J. C. F. Fryer exhibited a large series of the wings of Danaine and Euploëine butterflies from Ceylon, remains of these insects which had been observed by him to be eaten by birds, mainly by the so-called "Wood-Swallow," *Artamus fuscus*; also a few specimens of the same butterflies which had been killed by Asilids, these being distinguished by the fact that the bodies were nearly or quite intact.—The following papers were read:—"On the British Mycetophilidæ," by F. W. Edwards, F.E.S. "Culicidæ from Papua," by Frank H. Taylor, F.E.S., Government Entomologist to the Australian Institute of Tropical Medicine. "Pupal Coloration in *Papilio polytes*," and "The larval Habits of the Tineid moth *Melasina enerya*, Meyr.," by J. C. F. Fryer, M.A., F.E.S.

Wednesday, June 4th, 1913.—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair. The President announced that His Majesty the King had been graciously pleased to become Patron of the Society.—The death was announced of Lord Avebury, the oldest Fellow of the Society, and of Mr. Philip de la Garde.—Capt. F. Sitwell, Wooler, Northumberland, was elected a Fellow of the Society.—Mr. C. O. Waterhouse exhibited a blue variety of the female of *Rhynchites encovirens* recently taken at Burnham Beeches.—Dr. F. A. Dixey, a male and female specimen of *Tatochila immaculata*, Röber, with a pair of *T. stigmadiæ*, Stålgr., for comparison.—Mr. Donisthorpe, a fine series of *Claviger longicornis*, Mull. (including live specimens), with its proper host *Lasius umbratus nirtus*, with which he had taken it at Box Hill on May 16 and 23.—Mr. W. C. Crawley, male, virgin female, fully developed fecund queen, and a partly-developed queen of *Anergates atratulus*, Sch., taken for the first time in Britain, July, 1912, New Forest.—Prof. Poulton called attention to the striking resemblance between the parts of the under-side exposed during rest of many species of *Melitæa* and certain *Hesperidæ*—especially the large species *H. antonia*, Spey., *H. sidæ*, Esp., and to a less extent *H. carthami*, Hübn. He also exhibited a female of the Asilid fly *Heligmoneura brunnipes*, F. (*Asilus castanipes*, Meigen), together with the Oncodid (Cyrtid) fly *Physegaster maculatus*, Macq., both from Batua, Algeria. Also on behalf of Dr. Adalbert Seitz, F.E.S., the Fossorial model *Pepsis sapphirus*, Pal. de Beauv., and two of its mimics—the Reduviid bug *Spiniger ater*, Lep. et Serv., and the Locustid (Phasgoneurid) *Scaphura nigra*, Thunb., var. *vigorsii*, Kirby. All three had been captured together with a third mimic, a Syntomid moth of the genus *Macrocneme*, by Dr. Seitz, along not more than two hundred paces of a sunny road through the high forest between Santos and the little village of Sao Vicente.—Mr. J. C. F. Fryer, a light specimen of *Teniocampa gracilis* for comparison with that exhibited at the last meeting by the Hon. N. C. Rothschild.—Comm. J. J. Walker, on behalf of Dr. R. C. L. Perkins, a specimen of *Thalpochares ostrina*, Hübn., var. *carthami*, H.S., apparently freshly emerged from pupa, taken by Dr. Perkins at Paighton on June 1st, 1913.—The President, thirty-three specimens of *Celastrina argiolus* bred from one batch of eggs, sixteen of which emerged last autumn, and seventeen in May

of this year.—Dr. G. D. H. Carpenter gave an account of a brood of *Papilio dardanus* raised by him from eggs laid by a female of the *planemoides* form, consisting of twenty-two specimens—seven *hippocoon*, three *planemoides*, the rest males.—Dr. K. Jordan showed a Swallow-tail (*Papilio thoas thoantiades*), a Hawk-moth (*Protoparce diffissa diffissa*), and a Honey-bee (*Apis mellifica*), which were found dead at Buenos Ayres on *Araujia albens*, being caught by the proboscis in the flowers of that plant. Also, on behalf of Prof. Seitz, the cocoon and chrysalis of a Noctuid from China. The pupa bears dorsally at the base of the last segment a patch of sharp longitudinal ridges, and there are corresponding ridges on the inside of the cocoon. This stridulating apparatus enables the pupa to produce a loud chirping continued sound.—Dr. Longstaff exhibited a small bee (*Andrena*, sp.) with a coleopterous larva, apparently a Meloid, partly on, partly in its abdomen. Captured near Seville, Spain, April 15th, 1913.—The following papers were read:—"On the Relationship between certain West African Insects, especially Ants, Lepidoptera, and Homoptera," by W. A. Lamborn, M.R.C.S., L.R.C.P., F.E.S., Entomologist to the Agricultural Department of Southern Nigeria. With an Appendix containing descriptions of New Species by G. T. Bethune-Baker, Pres. Ent. Soc., W. L. Distant, J. Hartley Durrant, and Prof. R. Newstead, F.R.S. "Supplementary Notes on new or little-known Forms of *Acræa*," by H. Eltringham, M.A., F.Z.S. With description of a new form of *Acræa encedon* by Prof. E. B. Poulton, D.Sc., F.R.S.—GEORGE WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 11th, 1913.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Mr. Ashdown exhibited the imago of *Hyles euphorbie* bred from a larva taken at Aigle, Switzerland.—Mr. Turner, a larva of *Mamestra pisi* from New Cross, feeding on Michaelmas Daisy.—Mr. Sheldon, a collection of Heterocera taken in the Arctic areas of Norway and Sweden in 1911-12. Of the eighteen species shown, ten are to be found in the British Fauna. Species like *Plusia hochenwarthii*, *Anthrocera exulans* var. *vanadis*, *Psodas coracina* (*trepidaria*), &c., found in the high Alps, occurred there near sea level.—Mr. West (Greenwich), examples of the wasps *Vespa germanica*, *V. sylvestris* and *V. vulgaris*, to show the specific characters.—Mr. Curwen, a series of *Loweia alciphron* var. *gordius* from Iselle, showing much variation in intensity of ground colour, and a short series of *L. amphidamas* from Caux, near Montreux.—Mr. Step, specimens of *V. germanica* and *V. vulgaris*, to show the difference in the appearance of the face.—Mr. Carr, the large spider *Epeira quadrata* from Crockham Hill, on heather, and reported *Asphalia diluta* common at sugar, *Noctua glareosa* common, and *Agrotis agathina* fairly common.—Mr. Sich reported *Carpocapsa pomonella* as abundant.—Mr. Tonge reported larvæ of *Nonagria typhae* at Deal to be extensively parasitized this season.—Mr. Smith reported *Phryxus livornica* as occurring for the third year in succession at the Lizard, and also specimens of *Leucania vitellina*. *Agrotis lunigera* were in some numbers in the same locality.—HY. J. TURNER, *Hon. Report. Sec.*

Correction, August 28th, *C. viridis* = *C. equestris*.



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## NOTES ON THE LIFE-HISTORY OF *LYCÆNA ARION*.

BY F. W. FROHAWK, F.E.S., M.B.O.U.

In previous numbers of this Journal\* the author has dealt with the different stages of *Lycæna arion*. Since the latest of these contributions (vol. xxxix. pp. 145-47) further attempts have been made to elucidate the doubtful points in the life-history of this insect, but it has to be confessed that a considerable gap still remains in our knowledge of the matter. It is the purpose of this note to give a brief account of the most recent observations of the author in the hope that suggestions tending to further progress may be elicited from others who may be interested in the subject.

In the papers alluded to, the author recorded that the butterfly prefers to deposit its eggs on plants of wild thyme growing on or near anthills (the nests of *Lasius flavus*),† only a few eggs being deposited on each nest or group of plants. The young larvæ emerge in about nine days if temperature conditions are normal. The earliest food of the young larvæ consists of the buds (flower) and blossoms of the thyme,‡ but they also readily devour one another.† Thyme continues to be the food of the larva until it has moulted three times. At this stage—about twenty days after emergence—it drops from the thyme plants,‡ and it is from this point that our knowledge of the life-history begins to be uncertain. We do not know what are the habitat or the food of the larva in its fourth stage.

We are aware that the insect hibernates as a larva,§ and it may be assumed that it feeds for some time before doing so. We are, however, ignorant as to the periods when it enters on and leaves hibernation, and as to its behaviour during that episode. The larva is full-grown in the first half of June, so that its last stage extends over nine months.

In captivity, at the termination of their third moult, the larvæ refuse to remain longer on the thyme, and jerk themselves from

\* 'Entomologist,' xxxii. pp. 104-106; xxxvi. pp. 57-60; xxxviii. pp. 193-94; xxxix. pp. 145-47.

† *Ibid.* xxxvi. pp. 57-60.

‡ *Ibid.* xxxii. pp. 104-106.

§ *Ibid.* xxxix. pp. 145-47.



it on to the earth.\* There they proceed to hide themselves behind any suitable pieces of vegetation that they can find, their object being apparently to avoid the light. In the absence of hiding places they simply wander about aimlessly. In the night it is presumed the larvæ search for food; but it is established that at this point they have lost their cannibal habits.† The principal object of the experiments which are about to be described was to discover the natural food of the larvæ after they drop off the thyme plants, and here two clues leading in apparently opposite directions present themselves.

In the first place, the fact that the adult female deposits its eggs on plants growing on or near ants' nests, coupled with the well-known fact that ants are in the habit of milking the larvæ of many *Lycanidæ*, suggested that the larvæ of *arion* might be fed by ants or find food in their nests.‡ This theory is supported by the discovery in Cornwall barely below the surface of the soil on the top of an ants' nest of three full-fed larvæ § accompanied by one of smaller size—a discovery which definitely established the fact that the insect hibernates as a larva—but, as no more could be found in a large number of nests which were examined, the discovery in question may have been due to an accidental coincidence. There seems to be no reason to doubt that the larvæ referred to had entered the soil for the purpose of pupation, the discovery of two pupæ § in close proximity to one another by Mr. A. L. Rayward and the author having made it clear that more than one larva may select the same spot for this purpose.

The other theory is suggested by the fact that the larvæ after the third moult eat honey and bore into green peas,† on which food they can subsist for several weeks.

Much discussion has taken place since the publication of the author's previous articles in connection with the two theories which have been briefly mentioned, there being a sharp division of opinion among entomologists. Dr. Chapman (whose knowledge of the earlier stages of European *Lepidoptera* is probably unrivalled) and those with him are convinced that the larva of *arion* lives within the nests of the ants after its third moult. In opposition to this view it is urged that the eggs may be deposited on the ants' nests only in order that the larvæ may be protected from their natural enemies by the presence of the ants, which milk them; and also that, if the larvæ were ever really in the nests, they must have been found in the course of many thorough searches by the author and others. As to these searches it must of course be admitted that, as only a few eggs are deposited on each nest and the larvæ are so small and in colour resemble the soil so closely in September when some of the searches were

\* 'Entomologist,' xxxii. pp. 104–106.

† *Ibid.* xxxix. pp. 145–47.

‡ *Ibid.* xxxvi. pp. 57–60.

§ *Ibid.* xxxviii. pp. 193–94.

made, it is quite conceivable that some might have been overlooked. If further, as seems probable on the analogy of *Cupido minima*, which it much resembles in the larval state, the larva of *arion* should feed up in the autumn and hibernate as a fully fed larva, it would possibly be absent from the nest in the spring when careful searches were also made. While the negative result of these searches is thus explicable on Dr. Chapman's hypothesis, it must necessarily, as was first pointed out by the Hon. N. Charles Rothschild,\* militate against it, and it must also be noted that this hypothesis fails to account in any way for the avidity of the larva for green peas.

For the purpose of testing the rival hypothesis the author was able to secure, through the kindness of Mr. H. St. J. Donisthorpe, a number of living colonies of the yellow ant (*L. flavus*) in observation nests. These observation nests are ingenious contrivances by which one is able to study in close detail colonies of ants living under circumstances closely resembling their natural condition. Incidentally, it may be mentioned here that the individuals composing a colony of *L. flavus* hibernate during the winter. They do not feed at all, nor is any food stored in the nest at this season. When a larva which had completed its third moult was placed in an observation nest containing *L. flavus*, it wandered from partition to partition as if in search of something. It was occasionally milked by the ants, but otherwise they took no notice of it, and it ate nothing except a little honey which had been placed in the nest for the ants. On the other hand, if a fresh green pea or a scarlet runner bean was offered to the larva it at once bored into it and commenced to feed. This experiment, which was repeated a number of times without any material variation in the results, seems to the author to prove conclusively that the larva of *arion* does not feed on the ova, larvæ, pupæ or imagines of the ants, nor on their ejecta or excreta. It also proves that the ants do not feed it, though they might of course procure food for it.

In another experiment, a portion of an ants' nest was placed in a glass cylinder with a little vegetation on the top. The colony inside was small, but appeared to be otherwise in a normally flourishing condition. A larva of *arion* which had just completed its third moult was then placed on the surface of the nest and carefully observed. The larva gave no indication of a desire to burrow into the nest or to approach the ants. It roamed about for a while, then rested beneath a small fragment of a grass root and finally succumbed. This experiment also appears to furnish convincing evidence that the larva does not normally live within ants' nests.

It occurred to the author as an alternative explanation that

\* Ent. Rec. xxiii. p. 40.

the larva might conceivably subsist on the aphides which frequent roots on the surface of the soil, or on swellings produced by these aphides on the plants on which they feed, or on the excreta of these minute creatures, if any be deposited on the surface of the soil; but it must be admitted that any such explanation is unlikely to prove correct. On the other hand, the structure and characteristics of the larva of *arion* so closely resemble those typical of larvæ of other Lycænidæ that possess burrowing habits and subsist on succulent vegetable substances that, even if we were ignorant of the known fact that it feeds on fresh peas and beans, it would be difficult to avoid drawing the obvious inference.

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## A FEW COMPARATIVE NOTES ON SOME DIURNI IN THE SEASONS 1912 AND 1913.

By R. M. PRIDEAUX.

WHERE not otherwise stated, the following observations relate to the sandy wooded uplands in the neighbourhood of Brasted Chart, extending from Sevenoaks to Crockham Hill; with a few notes from the parallel range of chalk hills (the North Downs) from Otford to Oxted.

The season of 1912 began favourably, as was to be anticipated after the exceptional summer of 1911, and butterflies appeared early and in abundance.

The wet and cold summer that ensued, however, was so prohibitive of insect activities that 1913, in my experience, has been one of the worst seasons (especially the opening months) of which I have any records. The later appearances and second broods produced, it is true, specimens in more normal abundance.

*Pieris brassicæ*.—1912. From May 10th fairly common; second brood scarce.—1913. First brood scarce; single specimens from May 5th; second brood common from July 11th (in S. Devon) and July 28th here.

*P. napi*.—1912. The first brood abundant from April 24th, but somewhat undersized specimens; second brood scarce.—1913. First brood scarce from May 21st; second brood in abundance.

*P. rapæ*.—1912. From late April common; later scarcer.—1913. First brood scarce, not seen before May 11th; second brood in normal numbers.

*Euchloë cardamines*.—1912. First appearance (a female, curiously enough), April 21st; subsequently very common; ova found May 6th. Three males were seen fluttering round a pair *in cop.* for several minutes, May 10th. In the Boscastle district (N. Cornwall), where a fortnight was spent at the end of June and beginning of July, males of this species were recorded as late as June 24th.—1913.



Scarce and late, like nearly all the spring-emerging species; not recorded till May 13th.

*Colias edusa*.—1912. This species was evidently not rare at the end of June near Boscastle, but the cold and wet weather prevailing at the time precluded many chances of observation. A female, captured on the 23rd, lived for several days, but subsequently died without laying.—1913. The prevalence of "Clouded Yellows" this year has been a bright feature in an otherwise cheerless season. On June 3rd a female flew past me, near Westerham; on the same day my friend, Mr. F. Gillett, captured one on the N. Downs near his house, from whose ova he was successful in rearing some specimens, and on the 15th a chance meeting with a collector at Crockham Hill revealed another female, just taken by him. As our records show, these early specimens were the precursors of an abundant later emergence. From August 16th to the 25th (and doubtless later) the species was common on the slopes of the N. Downs, males greatly preponderating. The absence of any record of the species in the first fortnight of July, which was spent near Salcombe, S. Devon, is noteworthy, as it is usually to be found in those parts; presumably, the period was just "between the broods," which will also account for the absence of *Pierids* during this visit, with the exception of one *P. brassicae*, on July 11th.

*Gonepteryx rhamni*.—1912. This species is usually seen fairly commonly throughout these wooded hills, on which *Rhamnus frangula* grows plentifully; and in the spring of 1912 they were in rather unusual abundance from March 11th onwards. Eggs were found towards the end of April, and on the 28th seventeen were counted, all laid close together, on one shoot of buckthorn—an occurrence the more remarkable in that on several adjacent bushes no ova could be found. Larvæ that hatched on May 5th pupated on June 7th, and produced butterflies early in July. Scores of these butterflies were released in my garden, but scarcely any specimens were subsequently seen at large there or in the adjacent woods, only five examples being recorded—four of these on September 8th and 21st, and one only during the miserably wet and cold August.—1913. For the first time during nearly thirty years of recorded observations have I failed this spring to see hybernated specimens of this butterfly, nor could I discover that they had been seen by others in this immediate district. Mr. Gillett noted a few on the N. Downs, and I saw one male at Mereworth on June 14th. It is therefore scarcely surprising that the species in its summer emergence has been far to seek, only one being seen here, on September 28th. On the other hand, on the chalk hills opposite they have been fairly common this August. Although more eggs appear to be laid on the exposed and shrubby buckthorn bushes hereabouts, yet the larvæ would seem to survive their enemies more successfully on the spreading tree-like growths of *R. frangula*, which grow under the deep shade of beech and other trees. Here I have found them full-grown frequently, but have searched for the pupa in vain, except on one occasion, when one was found attached to a stem of heather some yards from the food-plant.

*Vanessa urticae*.—1912. After hybernation, April 17th. Not



very common in the summer. Full-grown larvæ were found here as late as September 27th, producing butterflies (in captivity) at the end of October until November 6th, all undersized specimens.—1913. Not very common at any part of the season in my experience.

*V. io*.—1912. A few hybernated specimens (the species is never abundant up here) from April 18th, on which date a specimen was seen feeding at sloe-blossom. Near Boscastle, at the end of June, the larvæ of this species and of other *Vanessids* were remarkably plentiful, and on one large nettle patch near Camelford, on July 1st, larvæ of *V. io*, *V. urticae*, *Pyrameis cardui*, and *P. atalanta* were all found feeding together. I do not record a single specimen of the fresh emergence here for 1912.—1913. I have not seen this species at all here this year. Larvæ were full-fed near Salcombe on July 1st, one imago seen near Dorking, August 30.

*Pyrameis cardui*.—1912. This was the butterfly of the season in my own experience, the early migrants especially appearing in very unusual numbers. The condition of these specimens varied largely, from (apparently) freshly emerged ones to such tattered, bleached survivals as, but for their flight, would have been hardly recognizable. The first was seen here on May 14th, feeding at the blossoms of the white beam; and from this date till near the end of June (when I left home for a fortnight) they were everywhere—throughout the woodland, by roadsides, in gardens, &c. Bugle flowers were often an attraction, but more commonly they preferred settling on bare ground exposed to the sun. Ova were laid readily on field thistle in captivity on May 19th, but after reaching a half-grown condition the subsequent larvæ (which hatched in eleven days) mostly died off from no apparent cause, as did many others that were captured at large. This high mortality, which is quite contrary to my experience of the species, was a feature of the season, Mr. Newman tells me, in regard to this and other larvæ, and was apparently due to climatic conditions. The butterflies were still in abundance near Boscastle in early July (still in “hybernated” condition mostly), where larvæ were also found on thistle and nettle; and larvæ were common hereabouts at the sides of cornfields, &c., during the remainder of July. On July 16th I had the supreme good fortune to find a pupa near Sevenoaks spun up in thistle, which the very next morning produced a superb aberration of the butterfly, closely resembling that figured in Newman’s ‘Butterflies’ (p. 64). The first freshly emerged specimen was seen on July 24th, and throughout the following month, whenever the wretched weather permitted their appearance, specimens were to be seen, but in nothing like the abundance that the profusion of their progenitors would have led one to expect.—1913. Only one “early” specimen was seen here, a very fresh one, on May 30th, but specimens were not rare near Salcombe early in July. I only record one newly-emerged one here, on August 28th, and one larva, on July 18th, which soon died.

*P. atalanta*.—1912. After *cardui* this species was most noteworthy hereabouts. First seen, May 12th, at holly blossom, and common during the remainder of the month. At the end of June and early July specimens of variable freshness were frequent near Boscastle. I witnessed the laying of an egg on July 4th, hatched

on the 12th, pupated August 16th, and emerged September 12th. Larvæ were more abundant than I have ever known them, first in N. Cornwall and subsequently hereabouts. Specimens were bred from larvæ (or pupæ), found at large, from July 19th until Nov. 21st, with scarcely a week intervening without an emergence. Unlike the experience with *cardui*, there was practically no mortality amongst the larvæ, either from parasites or from any other cause. The later appearance of the butterflies in nature was, of course, largely interfered with by the wet and cold season.—1913. Two "hybernated" specimens, on June 3rd, here, and one on July 2nd, in S. Devon, are the only earlier records for the species I have for this year. Fresh specimens were observed, singly, from August 28th until October 18th; not a sign of the larva—so common the preceding year—have I seen.

*Argynnis euphrosyne*.—1912. These extensive woodlands, disappointing as they are in regard to butterfly life in general, are specially so where the *Argynnids* are concerned. *A. euphrosyne* is the only species to be relied upon, and that is far from abundant. In May, 1912, from the 10th onwards, it was much commoner than usual.—1913. Scarcer this season, like most species; also later, from May 24th until June 11th. Always more abundant in Mercworth Wood, some miles east of Sevenoaks, but this is outside the radius under discussion.

*Epinephele janira*.—1912. First seen June 14th.—1913. First seen June 13th—an early date, considering the delayed appearance of most species. I saw the last specimen on October 9th on the N. Downs, and it could doubtless have been recorded there even later in this warm and sunny autumn by residents on those more favoured and flowery hillsides.

*Zephyrus betulae*.—1912. A few full-grown larvæ near Boscastle, beaten on June 22nd, all subsequently found to be ichneumonised.

*Thecla rubi*.—1912. On the N. Downs on April 27th. A few single specimens on these hills (where it is never common) in May; still out on the N. Downs on July 13th. Seen *in cop.* in N. Cornwall, July 4th, and on the same day a specimen was seen to oviposit on gorse, the egg being laid near the tip of a shoot in the axil of a spine.—1913. One, May 24th, near Sevenoaks; the species still abundant on the S. Devon coast, in the first week of July.

*Chrysophanus phlaeas*.—1912. From May 13th, common; abundant near Oxted, May 23rd, the later appearances pretty common. Last record October 4th.—1913. Very scarce in the early part of the summer; first seen June 2nd. Not one specimen was recorded in S. Devon during the first fortnight of July, though butterflies in general were there fairly plentiful. The late summer specimens were pretty common on the N. Downs, and one was seen in Kew Gardens on August 20th.

*Lycæna alsus*.—1913. This butterfly has been very scarce in its localities near Otford this season, where it is usually to be found in profusion.

*L. icarus*.—1912. First appearance, May 21st, on these hills; abundant on May 23rd on the N. Downs, where a male specimen was found drying its wings at about 2 p.m. Second brood pretty

common on the chalk, but scarce here.—1913. Remarkably scarce and late; not seen at all by me until June 13th at Oxted, and then by no means common; and Mr. Gillett tells me he only observed the species a few days earlier near his house on the N. Downs, a few miles further east. The second brood has, however, been abundant on the N. Downs, but by no means common hereabouts.

*L. corydon*.—1912. Two males, July 13th, near Otford; females egg-laying near Oxted, September 7th.—1913. Both sexes, only moderately common, near Oxted, August 14th.

*Cyaniris argyolus*.—1912. Some six or eight years ago this butterfly was by no means common hereabouts, in spite of the abundance of holly throughout the woods. Latterly, however, it has appeared in profusion, and even the adverse season of 1912, so detrimental to many species, seems to have affected this one less than most. From April 18th, when I record the first, a male, *argyolus* was abundant everywhere about these hills; rather less so on the chalk. There, where holly is rare or absent, probably *Cornus sanguinea* is one of the principal food-plants of the early brood of larvæ. On May 9th I saw a female lay one egg on an immature flower umbel of this shrub just beneath a bud, and larvæ subsequently fed on the petals and unripe berries, rejecting calyx or leaves. It may be of interest to note that near Boscastle, late in June, being unable to find dogwood thereabouts, immature berries of privet and elder were offered the larvæ but rejected, they having to be fed up finally on holly. The above-mentioned egg hatched in nine days and produced a butterfly on July 16th. Another egg was observed to be laid at the base of the ovary of a holly-blossom on May 11th. The last specimen I record of this brood was on June 9th, at rest upon a fence. The second brood began to appear on July 13th, specimens of which were less abundant than those of the earlier brood, but still common. A larva was found on ivy-bloom as late as September 17th, producing a butterfly on April 17th of this year.—1913. Although not nearly so abundant as last year, butterflies of both broods have been far from rare. First appearance of first brood, April 20th; of the second, July 29th. A specimen in Kew Gardens, August 20th. Larvæ of the second brood have been unusually common on ivy in September last.

*Hesperia alveolus*.—1912. First appearance, April 27th.—1913. First appearance, May 21st. A perfectly fresh specimen was taken at Mereworth as late as June 14th.

Brasted Chart, Kent, November 1st, 1913.

## LEPIDOPTERA AT ALBARRACIN IN MAY AND JUNE, 1913.

BY W. G. SHELDON, F.E.S.

(Concluded from p. 313.)

*Cupido sobrus*.—This species first appeared in the sainfoin fields on May 24th, it was not abundant then, but later we found it



common at the bottom of hot dry gorges, in company with *Melitaea desfontainii* and other species.

The specimens perplexed us a good deal, for they varied in expanse from 23 mm.—31 mm. and also in tint on the upper sides and in spotting on the under sides; and bearing in mind that Zapater gives the nearly allied *C. lorquini* as occurring, one could not be certain that some of the specimens were not that species. Mr. Rayward's careful examination of the genitalia, however, proves them to be all *C. sebrus*. Nearly all possess the second spot from costa on hind wing underneath, the absence of which is given by Kane as a distinguishing characteristic for *C. sebrus*.

*Cyaniris semiargus*.—Only a few specimens seen, the first on June 7th. Zapater speaks of this species as not being common in the district.

*Nomiades cyllarus*.—A very fine form was abundant in the sainfoin fields in May. Expanding up to 37 mm. both sexes have numerous bold ocelli underneath, and the blue at the base of the wings, upper side, in the females is much brighter than is the case in French specimens.

*Polygonia s-album*.—One or two specimens were seen by Mr. Jones after I left. Zapater speaks of it as rather scarce.

*Eugonia polychloros*.—Larvæ were frequent on elm, and the imagos were just coming out on June 20th.

*Aglais urticae*.—Larvæ were common in May, and the imagos bred therefrom proved to be a very magnificent race, with an average wing expanse of 60 mm., and no doubt this expanse would be considerably increased in the largest captured examples. The chief characteristic of the race, apart from size, is the richness of the tawny ground colour, which in this respect equals that of the Corsican form var. *ichnusa*, the width of the band on the hind wings in many examples, and the almost total suppression of the pale patches in the tawny bands, especially the one nearest the anal angle of the superiors. On my previous visit to the district I had noticed the rich coloured examples of this species, but they were not common and were strong on the wing, and I was then not able to secure a specimen for comparison. This form appears to be a well marked geographical race, which approaches in size and characteristics the Chinese form var. *chinensis*. I propose the name of var. *teruelensis*, n. var., for it. (See Plate xii., figs. 1, 2.)

*Pyrameis cardui*.—Abundant.

*P. atalanta*.—Not common, a few larvæ and imagos.

*Melitaea desfontainii*.—This fine Spanish species was first seen on May 24th in the Guadalavivier gorge near Santa Croche. Until June 7th we found it very scarce, only capturing one or two examples each day. On this date, however, Mr. Jones, on other species intent, prospected a cross gorge which came down to the main one, and discovered that this species was common in it, and from there we got as many specimens as we required. Afterwards we found it in similar places elsewhere, such as "The Vega," and on June 18th it was abundant at Losilla.

The males frequent the bottom of hot stony gorges, settling upon the rocks, taking short flights, and when not startled returning to



the spot they started from; the flight is characteristically *Melitaea*-like, and the specimens are not by any means easy to net. The females, which we did not find numerous, were occasionally to be found in the gorges, but more frequently in the undulating clearings on the ground above; in these clearings between the savin trees there was usually plenty of the reputed food-plant, a species of *Thymus*, which Zapater calls *T. aestivus*. The specimens vary a good deal, within certain limits, but are always abundantly distinct from those of any other species. My largest male and female expand respectively 52 mm. and 57 mm.

*M. phoebe* var. *occitanica*.—Common generally, first seen on June 1st.

*M. deione*.—Fairly common, but very local, only found in the main gorge at Santa Croche. The specimens are much like those I have taken at Granada, var. *nevadensis*, but the females are not so large or so variegated, my largest Albarracin and Granada females expanding 49 mm. and 54 mm. respectively.

*M. athalia*.—Zapater speaks of this species as being very rare; he is probably right, for the only example we came across was a male taken by Mr. Jones, in the Guadalavivier Gorge, above Albarracin, on June 23rd; the specimen is undoubtedly this species, and is a fine, strongly marked form.

*Brenthis hecate*. var. *aigina*.—This species, which in my previous visit I had taken at Bronchales and Losilla, was very late in appearing; Mr. Jones obtained a few examples at the latter locality on June 23rd, and again on June 28th; they were confined to a very small spot.

*Issoria lathonia*.—Common everywhere.

*Argynnis aglaia*.—Common at Losilla on June 23rd.

*A. niobe* var. *eris*.—Common at Santa Croche at the end of June.

*Dryas pandora*.—Frequent generally; first seen on June 18th.

*Melanargia lachesis*.—Common in some meadows near Santa Croche at the end of June.

*M. japygia* var. *cleante*.—A few specimens were taken by Mr. Jones at Losilla on June 23rd and on June 28th.

*M. ines*.—I first took a specimen on June 13th, on a hilltop on the way to Losilla; then, on June 16th, about half a dozen others on the hills skirting the Vega. At the end of June I understand it became frequent, generally on the dry hillsides. The Albarracin form is rather smaller than my Malaga specimens. Mr. Jones has one specimen which is without the pair of ocelli on the costal margin of hind wings.

*Erebia epistygne*.—The mention of this species being found near Albarracin in Zapater's Catalogue was one of the reasons why I felt compelled to time my visit early in May, for it seemed probable that specimens from this locality would prove distinct in some way from Southern French examples; and as British collectors had never met with them, and there were no specimens in the National Collection, I was very curious to see what they were like. We therefore made our first excursion at Albarracin for this species on May 15th. Puerta de la Losilla, the nearest locality given by Zapater, is a good four miles, uphill grind, from the town, and we did not meet with

our first specimen until we had got fully three miles beyond Losilla. Here, on stony, hilly ground, *E. epistygne* was not uncommon, and in two visits we obtained all we wished for. Afterwards we found odd examples amongst the hills in many directions round the town, and on one occasion I netted a male flying in a sainfoin field in the Valdevecar. The form, which is quite distinct in many respects from the French race, I have figured (Plate xii., figs. 6 and 7), and propose the varietal name of var. *virithus*, n. var., for it. It differs from its French congeners in size, the average wing expanse being about 46 mm., as against 54 mm., which is the average wing expanse of my Provence specimens; also in the narrower dark anal border to superiors—in some cases, as in fig. 7, this border is hardly perceptible—and the lighter anal tip to superiors; the ocelli on all wings are more prominent, and the under sides are more grey, not so brown.

*Hipparchia semele*.—Males of this species were first found on June 17th.

*Pararge maera* var. *adrasta*.—A fine and extreme form of this was not uncommon in May.

*P. megaera*.—Generally common.

*Epinephele lycaon*.—Mr. Jones captured a few males during the last days of his stay. There is a very fine form of the female, of which I have specimens, both from Albarracin and La Granja, and which is in other collections from Spain. This I have figured (Plate xii., fig. 4), and propose to name ab. *boopis*, n. ab. In this form, as will be seen, the ocelli on the superiors are much enlarged by black shading, especially the one nearest the anal angle.

*E. pasiphae*.—Common everywhere from June 8th, on which date the first specimens were seen.

*Cænonympha dorus*.—A few males were met with towards the end of June; later on the species swarms; they do not differ materially from Basses Alpes specimens.

*C. iphioides*.—This Spanish species was common at Losilla from June 11th onward. The specimens are not so large, nor are the ocelli so prominent as in my La Granja examples.

*C. pamphilus*.—Frequent, but not common; a small, weak form.

*Carcharodus alceae*.—Apparently not common; I only saw one example.

*C. altheae*.—A single specimen taken by Mr. Jones, superficially identical with Swiss examples of this species, Mr. Rayward finds is actually it.

*C. bacticus*.—Not common, but one picked up odd specimens everywhere. A good proportion of these were netted as they were flying at the blossoms of *Marrubium*.

*C. lavaterae*.—Not infrequent by the roadside at Santa Croche from June 5th. The form is a small one, my largest example expanding only 34 mm.; the ground colour of the superiors is rather browner than in Swiss specimens.

*Pyrus proto* was just coming out at the end of June; later on it is abundant.

*P. sao*.—Abundant generally. A form with very red under sides to the inferiors.

*Hesperia carthami*.—Very abundant; a rather small and brightly marked form first seen on June 6th. Mr. Rayward made certain of the identification by the genitalia.

*H. cirsii*.—Some examples of a species of *Hesperia* taken by me at the end of July, 1905, prove, on an examination of genitalia being made by Mr. Rayward, to be this species; they were abundant at that time in the Vega, and also at Santa Croche.

*H. serratulae*.—A Hesperid which was first met with on June 18th, and which superficially appeared to be this species, was found on examination of the genitalia to be it. Specimens were taken at Santa Croche and Losilla, but they were not abundant.

*H. onopordi*.—This species was fairly common. The first examples were taken on May 19th, and it continued in good condition until the end of June. The identification was confirmed by Mr. Rayward's preparation of the genitalia.

*H. malvoides*.—Zapater speaks of *H. malvae* being not scarce. Undoubtedly by this is meant *H. malvoides*, which we did not find uncommon. A preparation of the genitalia by Mr. Rayward shows it to be this species. First taken on June 10th.

*Nisoniades tages*.—Not infrequent from May 19th; all that we saw were var. *cervantes*.

*Adopaea flava*.—A few specimens were captured. It is not mentioned in Zapater's Catalogue, and is the only species of *Rhopalocera* we met with that is not.

The Heterocera were not much worked, but the following species were taken or identified:—

*Aglaope infausta*, *Anthrocera rhadamanthus* var. *cingulata*, *A. sarpedon*, *Arctia fasciata*, *Pseudopterna coronillaria*, *Gnophos mucidaria*, *Acidalia rubellata*, *A. rubiginata*, *Athroolopha pennigaria*, *Eurrantia plumistaria*, *Rhodostrophia calabraria* var. *tabidaria*, *Heliothis cardui* var. *purpurata*, *Leucania vitellina*, *Calophasia almoranda*, *Metopoceras chaliidja*, *Athetis hispanica*, *Acontia lucida*, *Erastria viridisquama*, *Tarache lucida*, *Pyrausta sanguinalis*, *P. diffusalis*, *Cledeobia moldavica*, *Cledeobia bombycalis*, *Crambus craterellus*, *Evergestis frumentalis*, *E. umbrosalis*, *Heterogynis penella*, *Ancylis unguicella*, *Pleurota bicostella*.

Youlgreave, South Croydon: September 4th, 1913.

## NOTES AND OBSERVATIONS.

BISTON HIRTARIA THREE YEARS IN PUPE.—On April 9th, 1910, I was fortunate in finding this insect *in cop.* and I successfully reared a good number of the larvæ. The larvæ were a fine healthy lot, and were all down before the end of July. Not one specimen had appeared by April, 1911. The pupæ were alive and healthy, but showed no signs of emerging. They were always kept outside. On March 29th, 1912, three fine *hirtaria* appeared, one male and two females, and moths continued to emerge up to April 10th, though still a number failed to do so. On March 27th, 1913, one female appeared,



and between this time and April 11th twenty-nine fine specimens in all emerged.—ROBERT LAWSON; 4, Moncrieffe Terrace, Craigie, Perth, N.B.

COLEOPTERA OF GLAMORGAN.—The first instalment of an annotated list, by Mr. J. R. le B. Tomlin, of Coleoptera known to occur in the county of Glamorgan, will be found in 'Report and Transactions of the Cardiff Naturalists' Society for 1912,' vol. xlv. pp. 41–58. Nearly three hundred species are entered as follows:—Cicindelidæ, 2; Carabidæ, 175 (4 doubtful); Haliplidæ, 6; Pelobiidæ, 1; Dytiscidæ, 52 (1 doubtful); Gyrinidæ, 5 (1 doubtful); Hydrophilidæ, 58.

LEPIDOPTERA OF HASLEMERE.—Mr. F. A. Oldaker has compiled an excellent list of the Lepidoptera occurring within six miles of Haslemere. This was recently published as 'Science Paper No. 5,' by the Haslemere Natural History Society. Two photographic plates and a map of the district accompany the list.

HADENA OLERACEA DESTRUCTIVE TO TOMATOES.—I believe it has not been brought to the notice of entomologists what havoc *Hadena oleracea* is creating amongst tomato growers. Tomato growers are suffering great losses all over the country (especially during this year) through this pest; and the trouble seems to be on the increase. In September I visited the nursery of a friend of mine who is one of the largest tomato growers in the North of London, and he showed me a bucket nearly full of pupæ which his men had collected to burn. These all came out of one house. The only remedies seem to be to collect the larvæ by hand, which is a slow process, and to take the top layer of soil off when the insects are in the pupal stage and burn it, which also means a great deal of labour. Of course being under glass the insects are protected against birds, and, though I examined a great number of larvæ and pupæ, I failed to find one ichneumonid. Being thus protected against two of their greatest enemies, the insects increase apace and make the nurseryman's fight against them all the harder. If any of your readers can suggest a better and more effective remedy than the two I have mentioned, I should be most grateful to hear from them. I have suggested that when the insect is in the imago state next year fumigation might be tried, but I am rather doubtful as to the efficacy of ordinary fumigants on a insect with so much vitality as *Hadena oleracea*.—B. S. WILLIAMS; 77, Durham Road, East Finchley, N.

ABERRATION OF BARATHA (MAMESTRA) BRASSICÆ.—On July 14th my father brought in to me a fine var. of *M. brassicæ* which he had found on a fence locally. The ground-colour is pale ochreous brown with dark fuscous markings, but the most remarkable point about the insect is the curious formation of the stigmata. The reniform and orbicular are joined by a white line, as in *P. piniperda*, only instead of being joined at the bottom, as in *piniperda*, they are joined at the top, giving the specimen a most extraordinary appearance. I also bred a fine form of this insect this year; the whole of the upper wings being suffused with deep blackish fuscous except the sub-terminal line, which is bright yellowish ochreous and broad, not



whitish and narrow, as is usual with this species.—B. S. WILLIAMS; 77, Durham Road, East Finchley.

*COLIAS EDUSA* NEAR OXFORD.—During the last week in August, at Stanton Harcourt, about ten miles from Oxford, I saw about a dozen specimens of *C. edusa*, and captured three, only one of which was in really good condition. They were all males, and were seen in one clover-field.—CHAS. F. THORNEWILL; 15, St. Margaret's Road, Oxford, November 3, 1913.

BIRDS EATING BUTTERFLIES.—Referring to Lieut.-Col. Mander's note on this subject (*antea*, p. 292), I may say that when watching lucerne fields at Folkestone last August I frequently saw birds carrying what looked like pieces of paper into the hedges. I carefully stalked them and hid myself near. I then saw a sparrow fly out, pick off a butterfly and fly with it into the hedge. They did it frequently while I watched. None were caught on the wing, but picked off as they settled. Although *Colias edusa* and *Vanessa urticae* were quite common, I never saw one taken, only common "whites," *P. brassicae* and *P. rapae*.—R. H. RATTRAY (Colonel); Tonbridge, Kent.

*MANDUCA (ACHERONTIA) ATROPOS* IN IRELAND.—On October 12th, 1913, I secured a specimen of *M. atropos* on the road running from Newbridge to the Curragh, about a mile from the town. The moth was at rest in the gutter, and the day was drawing to a close. Although I frequently hear of captures of this species in Ireland, this is only the second I have had the good fortune to meet with in that country.—H. T. STONEHAM; Stoneleigh, Reigate, Surrey, November 5th, 1913.

*MANDUCA (ACHERONTIA) ATROPOS* AT BRISTOL.—A fine male specimen of *Manduca atropos* was captured on October 19th in the graveyard of Bristol Cathedral, at rest on the wall of the Berkeley Chapel, by Mr. Hayward, Subsacrist.—GEO. C. GRIFFITHS; Penhurst, 3, Leigh Road, Clifton, Bristol, November 10th, 1913.

*HIPPOTION (CHEROCAMPA) CELERIO* IN SUSSEX.—I have recently received from Mr. W. B. Ellis, of Arundel, a specimen of the above moth. The insect was captured by a lady on a window in Arundel on September 24th, 1913. Except for slight damage to the left lower wing, the specimen is in fine condition.—G. B. CONEY; The Hall, Batcombe, Evercrech.

*TORTRIX PRONUBANA*.—On October 17th I took a male specimen of this moth on a shop window in Notting Hill Gate, W. I believe that this is the most easterly point at which it has been observed in the London district.—E. G. JOSEPHS; 23 Clanricarde Gardens, Bayswater.

*COLIAS EDUSA* IN BUCKS.—Referring to my notice of *Colias edusa* (p. 290, *antea*, where for "conifer" read "juniper"), circumstances prevented my visiting the Chilterns hereabouts again until the end of September. The 27th was a very hot, beautiful day, and at 5 p.m. the temperature in the shade stood at 72 deg., despite the fresh

south-east wind blowing. I had marked out in my mind a special spot on the chalk hills where I might expect to meet with our "Clouded Yellow" in a favourable season, nor was I disappointed, for though practically all other butterflies, except *G. rhamni*, and belated females of *A. medon*, had disappeared, I saw at least a dozen *edusa* in all, the males quite fresh, while I also had the pleasure of watching a worn female ovipositing. She chose by preference the most stunted plants of a *Medicago* growing sometimes actually in the gutter of the road, at this point confined between steep chalk banks well covered with *Helianthemum*, *Hippocrepis*, and scabious. My presence in no way disconcerted her movements; and she passed several times up and down the roadside, laying, I should think, quite a score of eggs, one at a time, and never two on the same small spray. Of these I brought a few home with me *in situ*, but when I came to open the air-tight box in which they were carried, a week later, I could find no trace either of larvæ or ova, and I think the young larvæ must have emerged and perished in the curled dry leaves which had been shaken out previous to examination. Cycling home by way of Tring, later in the day, I captured another perfect male on the side of the road just south of Aston-Clinton, and from the window of the train in the morning I had spotted yet another *edusa* on the railway bank between Chorley Wood and Chalfont Road Stations, where I see the late Rev. F. A. Walker met with it on September 13th, 1900 (Entom. vol. xxxiii. p. 273). We may conclude, therefore, that the butterfly had been widespread in south and mid Buckinghamshire during the month. But to which brood did these newly emerged males side by side with worn females belong?

My own third-brood imagoes were bred from ova deposited by a female taken in the Warren, Folkestone, about August 19th, and sent me by Mr. L. Newman. By the 28th all of the twenty-four were hatched, and they fed exclusively on *Lotus corniculatus*, refusing *Trifolium pratense* when it was introduced. But though there was comparatively little difference in the dates of emergence, individual larvæ developed much quicker than others. For instance, on September 28th, when the first three hung up for pupation, others were no more than an inch long; and I noticed that there is one moult, the third, which was most critical, seven or eight perishing at this stage apparently from exhaustion, as they ceased eating entirely, shrunk, and fell comatose from the food-plant. After remaining three days rigid on the leno, pupation took place with the "forwards" (about thirty-three days from hatching). On October 21st-22nd three full-sized females emerged (that is, about three full weeks after pupation). Meanwhile, the third emergence, apparently, was proceeding in Buckinghamshire under natural conditions, and on October 9th, another magnificent day, I was once more on the Chilterns, and at the same spot where I had watched the female *edusa* ovipositing on September 27th, my companion, Mr. N. C. Rothschild, bagged a single fresh example of the same sex. I see Mr. Newman in his recently published book of 'British Butterflies and Moths' says that "this larva may be forced from August ovum" (p. 18). This year, at all events, no artificial warmth has been required to mature the third brood.—H. ROWLAND-BROWN; Harrow Weald, October 26th, 1913.

ENTOMOLOGICAL CLUB MEETINGS.—July 5th, 1913, at Jesus College, Oxford. Professor E. B. Poulton in the chair. Other Members present were Mr. Horace Donisthorpe and Mr. W. Borrer (Hon. Member).

July 12th, 1913, at the Hand and Spear Hotel, Weybridge. Mr. Porritt in the chair. Other Members present were Mr. R. Adkin, Mr. H. Donisthorpe, Mr. T. W. Hall, and Mr. A. Sich; also Mr. R. South (Hon. Member).

October 24th, 1913, at Stanhope, The Crescent, Croydon. Mr. T. W. Hall in the chair. The other Members present were Mr. R. Adkin, Mr. H. Donisthorpe, Mr. H. Rowland-Brown, and Mr. A. Sich; also Mr. J. E. Collin and Mr. E. A. Smith (Hon. Members).

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 1st, 1913.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Herr Wilhelm Junk, 68, Sachsische-strasse, Berlin, W. 15, was elected a Fellow of the Society.—Mr. H. F. Bartlett exhibited a specimen of *Haplothorax burchellii* found under a stone on the lower part of Flagstaff Hill, St Helena, on March 25th, 1913.—Mr. P. A. Buxton, specimens of larval and imaginal Embiidæ (species as yet undetermined) from various localities in Tunis and Algeria and from the coast to south of the Atlas Mountains.—Mr. E. E. Green, a Drilid (?) beetle, from Ceylon, with remarkable elongate spatulate mandibular and maxillary palpi.—Mr. W. J. Lucas, on behalf of Mr. G. T. Lyle, some silk wound from a Braconid cocoon, together with specimens of the cocoons themselves.—Mr. C. B. Williams, specimens of the cocoons of the three British Coniopterygids.—Dr. F. A. Dixey, several boxes of Lepidoptera in illustration of the geographical relations of Mimicry.—Prof. Poulton read an extract from a letter written by Mr. C. F. M. Swynnerton, showing that the *hippocoon* form at Chirinda in S. E. Rhodesia is, genetically, just as predominant as the *cenea* form is in the Durban district.—Dr. Burr exhibited a specimen of *Diestrammena marmorata*, Haan, a Stenopelmatid Locustid from Japan, which occurs alive in Relf's Nursery at St. Leonard's.—Mr. H. Rowland-Brown, an example of *Araschnia levana*, sent him by Mr. T. Butt Ekins, of Penarth, who said that he had captured it at the end of May this year, on the outskirts of the Forest of Dean.—Commander J. J. Walker, a female *Colias edusa*, F., taken by himself in the Isle of Sheppey, August 21st, 1913, in which the margin of the hind wings was almost entirely clear golden yellow. Also a specimen of a *Ceramidia* near *C. chloropterygia*, Druce, taken by a lady in a fruiterer's shop in North Oxford: no doubt imported with fruit. Also the following Coleoptera:—(1) a short series of the very rare Halticid beetle *Psylliodes cyanoptera*, Ill., taken in June, 1913, at Wood Walton Fen. (2) A specimen of *Coccinella 10-punctata*, L., var. *confluens*, Harr., taken in the Isle of Sheppey, June, 1912, and another very curious aberration of the same beetle with golden yellow spots from Wytham Park, Berks, July



30th, 1913. (3) The very rare male of *Malthodes atomus*, Thoms., also from Wytham Park, June 14th, 1913. (4) A monstrosity of *Haliphus confinis*, Steph., with three perfectly developed tarsi on the right hind leg.—Mr. Dadd, a collection of Catocalids.—Mr. Durrant, on behalf of Mrs. W. C. Boyd, a series of specimens of British Lepidoptera of great historical interest, which she is presenting to the British Museum.—Mr. H. O. Holford, a specimen of *Cænonympha pamphilus* of abnormally large size, taken at Newlands Corner, and a female of *Ematurga atomaria*, almost without markings, from Milford.—Mr. D. Pearson, a drawer of butterflies taken this summer in the Tyrol, including specimens of the large Tyrolean form of *Polyommatus amandus*, and a series of *Erebia euryale* var. *ocellaris*.—The following papers were read:—"Illustrations of Specific Differences in the Saws of Female Dolerids," by Rev. F. D. Morice, M.A., F.E.S. "Additions and Corrections to my List of the Rhopalocera of Trinidad (1904)," by W. J. Kaye, F.E.S. "On the Urticating Properties of *Porthesia similis*," by H. Eltringham, M.A., F.E.S.

Wednesday, October 15th, 1913.—Rev. F. D. Morice, M.A., Vice-President, in the chair.—The following gentlemen were elected Fellows of the Society:—Messrs. Edward O. Armitage, Geelong, Victoria, Australia; F. W. Cragg, M.D., Capt. I.M.S., King Institute of Preventive Medicine, Saidapet, Madras; Walter James Dow, The Cottage, Lynwood Avenue, Epsom; Leslie John William Newman, Dept. of Agriculture, Perth, W. Australia.—Mr. F. H. Gravely exhibited lantern-slides showing the connection between asymmetry and geographical distribution in the Indo-Australian Passalids.—Mr. F. Enoch, photographs of the male and female of a new Mymarid.—Mr. Donisthorpe, specimens of the rare myrmecophilous Diptera, *Platyphora lubbocki*, Verrall, *Enigmatias blattoides*, Meinert, and *Peyerimhoffia brachyptera*, Kieff.—The Hon. N. C. Rothschild, specimens of *Zygæna filipendulæ* from the Isle of Lismore, Scotland, and an example resembling them from Folkestone. Also specimens of *Chrysophanus dispar* var. *rutilus* from Hungary and other localities.—Mr. H. Rowland-Brown, examples of *Chrysophanus dispar* var. *rutilus* captured by him in the marshes of the Gironde below Bordeaux, on August 1st and 2nd, 1911, to compare with the much larger form taken in Hungary by Mr. N. C. Rothschild. Also a specimen of *Agriades coridon* var. *syngrapha*, Kef., taken in the Chiltern Hills on August 9th, 1913, being the first ever recorded therefrom; with several examples of this variety taken by him at Dompierre-sur-Mer, and other female forms.—Capt. E. B. Purefoy, a short series of *G. cleopatra* which included two gynandromorphous specimens. Mr. L. W. Newman, four gynandromorphous specimens of *Smerinthus populi*, three with the left side female and right side male, and one *vice versa*. In three of the specimens there was no trace of variation in the wings either in size or markings, the antennæ only denoting gynandromorphism. Also four curious female specimens of *A. coridon*, three having the right pair of wings much smaller than the left and heavily dusted with blue scales, the left side being normal; also one specimen similar but *vice versa*. All



were taken wild in Herts in 1913.—Dr. G. W. Nicholson, a specimen of *Pterostichus aterrimus*, Pk., from Cloverhill, Co. Cavan. The only other Irish record is from Co. Cork.—Mr. E. E. Green, a transfer of a remarkable aberration of *Telchinia violæ*, Fab., taken by Mr. G. Halkett, in Ceylon. Also Jassidæ from Ceylon, parasitised by an undetermined species of *Gonatopus*.—The Rev. G. Wheeler, on behalf of Miss Macbride, a number of living specimens of the Longicorn beetle *Acanthocinus ædilis*, L., taken in a timber-yard at Bow.—Dr. Longstaff, on behalf of Mrs. Waterfield, a box of Sudanese Pierine butterflies taken by her, and on which she contributed notes.—Prof. Poulton, a set of four males and one female, and another of two males and one female, of *Metriorrhynchus semiflabellatus*, Thoms. Both sets were captured at Moor Plantation, near Ibadan, S. Nigeria, by Mr. Lamborn. Also the following insects, bred by Mr. W. A. Lamborn from the nests of Hymenoptera-Aculeata at Moor Plantation:—1. A male *Megachile cincta* (Sept. 17th), and the Cantharid beetle *Zonitis eborina*, Fahr. (Sept. 17th). 2. *Odynerus* sp. inc. (Sept. 17th); the species exists unnamed in the collection of the British Museum. 3. A female *Mutilla floralis*, Klug.—“This female Mutillid emerged July 26th, from a mud nest, probably that of *Sceliphron spirifex*, L., found July 14th.” 4. *Chrysis* (*Tetrachrysis*) sp. inc. (July 26th), *Chrysis* (*Tetrachrysis*) *lyncea*, F. (Aug. 3rd), and *Sceliphron spirifex*, L., female (July 31st). All these insects emerged at the recorded dates, from a mud nest of *S. spirifex*.—GEORGE WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*September 25th*.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Exhibition of lantern-slides by members as follows:—Mr. C. B. Williams, an adult male Embiid, bred from a larva from Algeria; also a piece of bark showing the silky tunnels made by the Embiid larva.—Mr. Dennis, flower groups in nature, and the fuller's teazle growing and drying for use.—Mr. Main, details of the life-history of the larch-sawfly, and gave an account of its habits at the different stages.—Mr. Lucas, specimens of the local grasshopper, *Gomphocerus rufus*, from Bookham Common, and also a bred female.—Mr. Newman, *Agriades coridon* from Herts, including ab. *semisyngrapha*, and a female specimen with asymmetrical wings, the smaller pair dusted with blue.—Mr. Curwen, *Brenthis euphrosyne* from several localities, those from the higher Alps being mostly large and light in colour, instead of dark and small as usually stated.—Mr. Moore, the aberration of *Rumicia phleas*, captured during the recent Field Meeting at Worms Heath. The upper and under side of the forewings had much enlarged spots = ab. *magnipuncta*.—Mr. West (Greenwich), a series of the Coleopteron, *Dacne rufifrons*, taken from the fungus recently exhibited by Mr. Edwards, and a short series of the beautiful *Cassida vittata*.—Several members reported that *Colias edusa* had been seen in numbers at various places, Boxhill, Margate, Folkestone, &c., and that *C. hyale* had been taken.—HY. J. TURNER, *Hon. Report. Sec.*

## RECENT LITERATURE.

*Text-Book of British Butterflies and Moths.* By L. W. NEWMAN and H. LEEDS. Pp. 1-217. St. Albans: Gibbs & Bamforth, Ltd., 1913.

THIS very well arranged and practical handbook to the British Lepidoptera really seems to be the last thing in collecting made easy, and to the man who wishes to fill his cabinet in the most expeditious manner it is the very thing he has been looking for these many years. We have been waiting a long time for something to replace "Merrin."

The bulk of the book (pp. 16-122) consists of the Treatise—hardly a well-chosen title—given in tabular form under each species (English and scientific names), the time of occurrence of each stage of the insect, its food-plant, and many other useful facts, including localities. And it is very satisfactory to note that under this heading the information afforded, though exact and often detailed, is not such that it would be likely immediately to hasten the extinction of some of our rarest insects. The Systematic Arrangement is a laudable attempt at a difficult task—no arrangement can suit everybody's ideas, but might not the author's names have been included? The list of food-plants is quite useful, and the index, the key to a book of this kind, so far as tested, leaves nothing to be desired. One other point—why have the butterflies been kept separate from the moths throughout? Is it for the benefit of the collector, whose interests do not extend beyond the five dozen odd species to be found in these Islands? In any case, it is a serious drawback to quick reference, and might easily have been foreseen.

The authors are to be congratulated upon so successfully carrying through such an arduous task; the collector, without doubt, will not be slow to reap the benefit.

N. D. R.

*Annals of Tropical Medicine and Parasitology.* Series T. M. vol. vii. No. 2, Liverpool, June 10th, 1913, and No. 3 A, Liverpool, August 11th, 1913.

As usual this periodical is chiefly occupied, as far as entomologists are concerned, with Diptera in connection with disease. By those who give attention to this subject much matter of interest will be found. More especially concerned with entomology is a report by the entomologist, Llewellyn Lloyd, on *Glossina morsitans*, and the description by Prof. R. Newstead, F.R.S., of a new Tsetse-fly, *Glossina severini*, from the Congo Free State.

W. J. LUCAS.

*Thirty-sixth Annual Report and Proceedings of the Lancashire and Cheshire Entomological Society. Session 1912.* Pp. 1-56. Published by the Society.

"ICHNEUMONS" form the subject of the Vice-President's Address (Mr. Claude Morley), and Mr. H. St. J. K. Donisthorpe contributes a paper "On Some Remarkable Associations between Ants of Different

Species." A Portrait of the late Mr. Samuel James Capper is also included.

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*Manchester Entomological Society. Tenth Annual Report and Transactions. 1912. Pp. 1-49. Published by the Society.*

AMONG the contents are two papers—"Notes on the Life-History of the Leaf-Insect (*Pulchriphyllium crurifolium*, Serv.) and the Mantis (*Sphodromantis bioculata*, Burm.)," by Mr. H. S. Leigh; and "Notes on the Actias Group of Saturnidæ and Descriptions of Two New Genera," by Mr. J. Henry Watson. There is also a plate, from a photograph by Mr. R. Tait, Junr., on which are shown twelve interesting aberrations of *Abraxas grossulariata*. The descriptive letterpress accompanying the plate is by Mr. B. H. Crabtree.

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*Proceedings of the South London Entomological and Natural History Society for the Session 1912-13. With ten plates. Pp. i-xvii and 1-154. Published at the Society's Rooms, Hibernia Chambers, London, S.E.*

THERE are several papers of very great interest to entomologists in this excellent volume. Among them the following may be mentioned:—"Varietal Names" (pp. 1-6, plates i.-iii.), by Robert Adkin, F.E.S.; "Labelling Entomological Specimens" (pp. 7-12), by R. Adkin; "The Genus *Cænonympha*" (pp. 13-20), by A. E. Gibbs, F.L.S., F.E.S.; "Notes on Earwigs" (pp. 21-27, plates iv., v.), by W. J. Lucas, B.A., F.E.S.; "Mimicry in Coleoptera" (pp. 28-38, plates viii.-x.), by C. J. Gahan, M.A., F.E.S.; and "An Outline of the Generic Types of British Lepidopterous Ova, with some exceptions" (pp. 46-59), by A. E. Tonge, F.E.S. The latter forms part of the "Annual Address."

The three figures on plate vii. depict remarkable beetle larvæ exhibited by Mr. C. J. Gahan; and two specimens of *Pieris napi* var. *byronia* are shown on plate vi.

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*A Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne. By JOHN E. ROBSON, F.E.S. Vol. ii.—Micro-Lepidoptera. Part ii.—Tineina and Pterophorina. Index to Vol. ii. Edited by JOHN GARDNER, F.E.S. Pp. i-vi and 107-289. London: Williams & Norgate. 1913.*

IN this instalment—the final one—of the important Catalogue of Northumberland and Durham Lepidoptera compiled by the late Mr. Robson, three hundred and ninety-seven species belonging to the Tineina and fifteen species of Pterophorina are enumerated. Valuable, often copious, notes accompany each entry.

The part now under notice, together with part i. (published in 1905), forms vol. xv. of the 'Natural History Transactions of Northumberland, Durham, and Newcastle-upon-Tyne.' It includes an Introduction by Mr. Gardner, also indexes to genera and species, and a portrait of the author of the Catalogue.

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WITH THE ASSISTANCE OF

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‘ By mutual confidence and mutual aid  
Great deeds are done and great discoveries made.’

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## ADDENDA.

P. 313, l. 33, after *megæra* add *Satyrus cordula*.

## ERRATA.

P. 303, l. 25, for *pherestes* read *pheretes*.

P. 312, l. 5, for *cordulea* read *cordula*.

P. 313, l. 38, for eighty-nine read ninety.

P. 315, l. 20, from bottom, for *climene* read *clymene*.



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## SOME REMARKS ON THE ATLANTIC FORMS OF *SYMPETRUM STRIOLATUM*, CHARP.

BY KENNETH J. MORTON, F.E.S.

IN the 'Revue des Odonates' (1850), p. 43, in discussing the *Libellula ruficollis* of Charpentier, de Selys writes as follows:—"M. Hagen m'a communiqué deux des trois exemplaires types reçus de Portugal par M. de Charpentier; ce sont de vrais *striolata* mâles très adultes, mais en mauvais état de conservation. . . . Les pieds sont comme tournés au gras et les lignes jaunes sont très-étroites, surtout sur les cuisses (qui au premier abord paraissent noirâtres), mais elles existent. La taille est très grande, mais pas sans exemple en Belgique." Lower down on the same page we read: "J'ai vu dans la collection de Miss Ball à Dublin, des exemplaires mâles adultes qui avaient aussi les pieds très-peu lignés de jaune."

In the "Revision des *Diplax* paléarctiques" ('Annales de la Soc. Ent. Belg.', xxviii. p. 35 (1884), de Selys describes a race of *S. striolatum* from Madeira under the name of *nigrifemur*, of which he says:—"Les femurs sont noirâtres sans ligne jaunâtre, et aux tibias le jaunâtre n'occupe qu'une raie externe étroite. La taille est très grande: abdomen ♂ 27: ♀ 26-29. Aile inférieure ♂ 30-33; ♀ 30-33 . . . les parties noirâtres des côtés du thorax sont très foncées, de sorte que les deux bandes jaunâtres qui les divisent, sont fort tranchées."

These are the first indications of the existence of what may be termed an Atlantic race of *S. striolatum* characterized by darker femora, and usually by more strongly pronounced lateral thoracic markings than in the more typical forms.

The next occasion on which exceptionally dark *S. striolatum* are alluded to, the insects in question came from a somewhat unexpected and in some respects rather remote point, and the imagination of those who had to do with them seems to have been rather exercised concerning them.

Mr. Lucas in 'Entomologist,' May, 1900, p. 139, recorded the capture at Stornoway by Mr. Fremlin of two females of a *Sympetrum*, and wrote of them as follows:—"The conclusion to which we must come, seeing there are two specimens thus pre-



cluding an aberration, appears to be that the insects belong to a form of *S. striolatum* somewhat resembling *S. scoticum* (probably a local race), or else that both insects are hybrids between the two species. Mr. McLachlan, who has examined the insects, inclines to the latter opinion." A good figure accompanies this record.

Further, in 'Entomologist' for June, 1912, p. 171, Mr. Lucas records a pair of dragonflies captured by Colonel Yerbury at Lochinver, Ross-shire (I presume Sutherland is meant), which are said to be the very counterparts of the Stornoway specimens. He gives to these examples the name of *S. nigrescens*, and considers them either a new species or a very distinct race of *striolatum*. In his remarks there seems still to be a tendency to associate the insects in some way with *S. scoticum*, and one is tempted to regard his description as a little forced to maintain this. Unfortunately Mr. Lucas does not compare his specimens with those from other localities in Scotland, England, Ireland, or elsewhere. There is accordingly room for some further observations.

When Mr. Lucas's original remarks appeared in 1900 I was not greatly interested in the subject. In 1912 his suggestion of the existence of a species of *Sympetrum* localized in the extreme north-west of Scotland seemed inconceivable, and considering the known powers of *Sympetrum* as a flier, the idea of a local race restricted to the same region was almost equally difficult to accept. After comparing the description with that of the var. *nigrifemur*, which it at once recalled, I gave the matter no further consideration until I received an enquiry from Dr. Ris asking me what I knew of *S. nigrescens*, the description of which had been brought under his notice by Mr. Herbert Campion. With the ready co-operation of my friend and neighbour Mr. William Evans, I was able without any delay to send Dr. Ris specimens from the west of Scotland evidently similar to Mr. Lucas's, and, together with these, series of *S. striolatum* from the north of Ireland and the New Forest for comparison. Since then, by the kind assistance of friends and correspondents, I have examined quite a number of examples from different localities, and the conclusion come to is that the form described by Lucas extends with a certain amount of variation, both individual and local, over the whole western fringe of Scotland; while examples from Ireland, especially from the north and west, although more variable and in some respects intermediate, still retain some of the same characters, and in any breaking up of the species into races would fall to be associated with the Scottish form rather than with the typical one. Fortunately Dr. Ris visited Brussels in the autumn, and was able to re-examine the types of *nigrifemur*. His conclusions on the whole subject will appear in the additions to his great work on the Libellulinæ, but I believe that I have

his sanction to state that our Scottish insect will fall in his revision of *S. striolatum* under the subspecies *nigrifemur*.

Just after sending the material to Dr. Ris, Mr. G. G. Blackwood, of Edinburgh, brought to me most opportunely a very nice little series (four males, one female) of *S. striolatum*, in very mature condition, which he had taken at Mallaig, Inverness-shire, on September 4th last; and having found it useful to tabulate the principal characters of these and of the more typical English form, I give here a reproduction of this tabulation in part, along with two diagrams showing the lateral thoracic markings, taken respectively from males from Thorney, Cambridgeshire (Fig. 1) and Mallaig (Fig. 2).

## ENGLISH. (Male.)

Line at base of the frons ends at the eye, without going downwards.

Humeral and second lateral sutures very narrowly marked with black. The first lateral suture in its upper part hardly marked at all (sometimes, however, the narrow median field (F, G) may be lightly outlined in fuscous).

Usually five fairly well-defined yellowish spots surrounded by black on the sides of the thorax above the legs. These spots are distributed thus on

A } mesinfræpisternum.

B }

C : mesepimeron.

D }

E } metinfræpisternum.

F { This field is the metepisternum,  
G { and in the typical forms is  
not divided into spots.

The above spots may be more or less confluent; thus A, B may be confluent or just separated by a narrow neck, rarely quite separate; C may touch E or may be distinctly separate; D may be partially confluent with E or narrowly separated.

Sternum mostly yellowish, the sutures sometimes marked with blackish.

## WESTERN SCOTTISH. (Male.)

Line extends downwards somewhat, as in *vulgatum*.

Humeral suture more heavily marked with blackish. Narrow middle field usually strongly outlined in fuscous and divided by a broad diagonal line, the two enclosed spots (F, G) varying in size, but the one nearer the stigma always smaller and triangular.

Note.—Even in an otherwise very dark example, the infuscated outline of the middle field is slight and the diagonal division hardly marked.

Spots A, B, C, D, E variable, but all much reduced in size, and in the Mallaig examples never confluent.

Sternum mostly blackish posteriorly, with a yellowish oval marking on either side of the middle line, these markings diverging caudad and having a yellowish tail (the black condition is no doubt in part the result of age).

## ENGLISH. (Male.)

Trochanters with a large black spot; femora and tibiae externally yellowish, the yellow on femora divided by a strong black line.

Abdomen beneath marked longitudinally with black.

Hind wings 27-30 mm.

## WESTERN SCOTTISH. (Male.)

Legs in the Mallaig specimens practically all black except distal half of anterior trochanters and the yellow lines on all the tibiae. While there is no reason to doubt that the legs are much blacker always than in the typical forms, there is here and there just the faintest trace of yellow on the femora, the relics of a certain amount of that colour which has become gradually obliterated through age (see on this point the slight discrepancy in Mr. Lucas's two descriptions).

Very broad black markings occupy the greater part of each side of the ventral suture, the red being reduced to mere streaks. Rounded spots near genitalia small.

Black lateral longitudinal markings much more strongly developed than in the typical forms.

Hind wings 25.5-27 mm.



Two males (coll. W. Evans), Glen Aros, Mull (August 6th), and Morvern, Argyllshire (July), agree very well with the Mallaig examples, that from Mull being especially dark. A female from Moidart, Inverness-shire, in September (coll. Evans), has the thoracic spots rather larger, and the femora distinctly lined with yellow.

A fine male from Talladale, Loch Maree, Ross-shire (August 11th), which has the sides of thorax very darkly marked, has distinct narrow yellow lines on the femora, while a female also from the Loch Maree district is very similar to the Moidart female (male and female, coll. J. J. F. X. King). Two very small specimens (male and female, the latter teneral, hind wing, male, 24 mm.) are also in King's collection, without label, but

believed to be from the island of Coll. In these the boundaries of the middle field are heavily shaded, and the legs are narrowly lined with yellow. Further, Mr. King reports two males from the island of Islay (July 13th), which are of the true western Scottish form, the lateral markings of thorax agreeing with diagram No. 2, excepting that spot *g* is rather larger, the dark boundary of the upper part of the field being narrow.

Three examples from Tayvallich, in Kintyre, deserve special notice (two males and one female, coll. A. M. Stewart, Paisley). The tendency of the line at the base of the frons to go downwards is not so much pronounced, being more strongly marked downwards in the female than in the males. The narrow middle field of the thorax is distinctly outlined in fuscous, but the diagonal line is less clearly developed (partly, I think, a matter of age). Thoracic spots rather larger than in the northern examples, but *c*, *d*, *e* always well separated by broad black margins; in one male *a* and *b* widely separated; in the other two connected by a narrow neck. The yellow spots on the metasternum long oval, the yellow tails becoming definite long wedge-shaped markings; following these is an irregular semi-circular black marking of varying breadth, the space enclosed being yellowish, but tending to become fuscous and probably becoming blackish with age. In the males the narrow yellow lines on the femora are distinct; but in the female they tend to become infuscated. Ventral surface of abdomen perhaps somewhat discoloured, but apparently not differing from the northern specimens, and in great part black.

The above are from the northern part of Kintyre, and they constitute a natural link with the Irish forms. The extreme southern point of the long peninsula of Kintyre is only a matter of twelve and a half miles distant from the Irish coast, surely a mere trifle to a migrating *Sympetrum*.

From Emyvale, Co. Monaghan, Ireland, I have before me a series of four males and three females. They are rather young, but they have much in common with the Scottish forms. The femora are lined with yellow, but the legs are over all darker than in the typical forms. The thoracic lateral spots are variable in size, but in some they are quite as small as in some of the Scottish specimens; *a*, *b*, *c*, *d*, *e* are completely isolated in all of them; the narrow middle field is always outlined in fuscous, and in three of them (one male and two females) the diagonal line is clearly marked. Six of these have more or less dark shading at the side of the eye.

By the very kind assistance of Mr. J. N. Halbert, I have been able to examine a series of specimens obligingly lent by the National Museum, Dublin, and originating from many different points in Ireland. They are from the following localities, *viz.*:—

Males (one from each locality):—1. Rostrevor, Co. Down,



September 2nd. 2. Dublin. 3. Cappagh, Co. Waterford. 3a. Cappagh, Co. Waterford (coll. J. J. F. X. King). 4. Cappoquin, Co. Waterford, August 3rd. 5. Glencar, Co. Kerry. 6. Caragh Lake, Co. Kerry, July 30th. 7. Killarney, Co. Kerry, July 15th. 7a. Killarney, Co. Kerry, August 7th (coll. King). 8. Mallaranny, Co. Mayo, July. 9. Westport, Co. Mayo. 10. Clare Island, Co. Mayo, July. 11. Achill Sound, Co. Mayo. 12. Coolmore, Co. Donegal. 13. Derry. 14. Poyntz Pass, Armagh, September 26th.

Females (one from each locality):—1. Cappagh, Co. Waterford. 2. Waterville, Co. Kerry, July 27th (teneral). 3. Parknaskilla, Co. Kerry. 4. Westport, Co. Mayo. 5. Ardara, Co. Donegal.

Hind wing, male,  $26\frac{1}{2}$ –28; female,  $27\frac{1}{2}$ –29.

In analysing the above, it may be said, with regard to the males, that the femora are in the darker condition alluded to under the Emyvale specimens, any exceptions being unimportant. The thoracic spots A, B, C, D, E (with one or two exceptions where A, B are nearly connected) are of variable and usually moderate size, but they are practically always completely isolated, and in 6, 9, and 11 run rather small, approaching the Scottish form. The middle field of the thorax, however, is frequently hardly outlined at all; this is the case in 1, 2, 3a, 4, 5, 6; in the others it is outlined, although sometimes rather faintly; in 9 strongly, with traces of the diagonal line. The sternum, in nearly every case, is marked with black, sometimes rather strongly; and the under side of the abdomen seems much blacker as a rule, especially in the anterior segments, than in the more typical forms. The shading at the side of the eyes is more or less marked in 3a, 6, 7, 7a, 9, 12, 13, 14, and in the others hardly or not at all indicated. The females are less satisfactory in condition. The thoracic spots A, B, C, D, E are all isolated except A, B in 1, 2, 4, in which they are narrowly connected; the middle field is always outlined.

Further Irish material in Mr. King's collection, examined by him, seems to be very constant in regard to the generally darker condition of the legs, and also the usually darker condition of the under side of the abdomen, but is in other respects variable. In a male from Wexford; male, Westport; male, Killarney, and two males from Cappoquin, the lateral markings of the thorax are much as in diagram No. 1; while females from Killarney and Cong, Co. Mayo, are almost similar in that respect. One female from Athlone is almost a typical *striolatum* as regards the thorax; another from the same locality is an intermediate. One from West Meath has the middle field outlined in fuscous, while another from the same county is described as very near to an example from Islay.

Three males from the Isle of Man, also sent by the Dublin

Museum, are interesting. They tend towards the intermediate condition, the spots, especially c, d, e, being smaller and the legs darker than in the typical form.

Finally, a female taken by myself at Christiansand, Norway (June 17th), may be mentioned. Although very young and the infuscation of the yellow on the femora only slight, the *nigri-femur* characters hold good in respect of spots A, B, c, d, e being all well separated, the fuscous outline of the middle field being heavily marked, the diagonal line being also broad and well defined. Hind-wing 27 mm.

The distribution of *Sympetrum striolatum* in Scotland has been fully and carefully worked out by Mr. Evans ("Odonata of the Forth Area," Proc. Roy. Physical Soc., xvi. pp. 87-96, 1905, and 'Annals Scot. Nat. Hist.,' 1911, pp. 14-25). It seems worthy of notice that, while the species apparently occurs all along the western seaboard of Scotland, including at least the larger islands, it is found rarely in the east of Scotland, and almost certainly does not breed there. Further, I am inclined to believe that the ordinary northern limit of *S. striolatum* as a British breeding species on the east coast must be drawn considerably south of the Scottish border, probably about the Humber, but further observations are required to verify this. Mr. Porritt says that he has no doubt that the species breeds regularly in the low-lying lands at Askern and probably all over that (the Doncaster) district, but not in the hilly districts of the county, *i. e.* north, north-east, east, and most of the south-west, although it seems to occur sporadically in most parts of the county. He also thinks it may breed in the Hull and Goole district, although he has never seen it there.

Ireland and the west of Scotland have in common a comparatively mild and moist winter climate, and this condition may not only render possible the existence of *S. striolatum* in the west and north, while it fails on the east coast of our country, but also account for its melanic tendencies. Very likely these tendencies vary from season to season, and no doubt the influx of migrants from other areas has something to do with the presence of intermediates.

13, Blackford Road, Edinburgh: November, 1913.

## NOTES ON THE LIFE-HISTORIES OF *HESPERIA TESSELLUM* AND *H. CRIBRELLUM*.

By THE HON. N. CHARLES ROTHSCHILD, M.A., F.E.S.

HERRN HERMANN RANGNOW, when recently collecting in the Ural Mountains, was fortunate enough to discover the larvæ and food-plants of the above-named insects, and has permitted me to record his observations in this Journal.

*Hesperia tessellum.*

Caterpillars were found from the middle of May to the 10th of June on a species of *Phlomis* (certainly from the description, *P. tuberosa*). The larvæ spin the two edges of a leaf together on the upper surface, and live within this leaf. The colour of the larva is mouse-grey, with a black head and yellow collar. There are two black rows of dots on the back, an excellent characteristic of the species. The imago begins to emerge after the middle of June, and there is apparently a partial second brood in the beginning of August.

*Hesperia cribrellum.*

The larva of this species is indistinguishable from that of *H. carthami* var. *mæschleri*, and lives spun up among the leaves of a species of *Potentilla*. The caterpillar is full-fed in May, and the imago emerges at the beginning of June.

## A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from vol. xlv. p. 17.)

### (iv) *Isère and Drôme. The Vercors.*

AFTER a year's silence on the subject of "fresh woods and pastures new" explored in France, I am again able to take up my pen to continue the series of short papers published by me in the 'Entomologist' for 1911-12. And I am the more encouraged to do so when I hear that my brother naturalists and collectors not only read these papers, but actually follow in my footsteps; and this at other seasons of the year than those of my travel. So that, as time goes on, we may hope to obtain not only a fleeting record of the captures and observations of a week or two spent in the several localities, but a solid contribution to the knowledge of the lepidoptera occurring there from year's end to year's end. Most of us are compelled to do our collecting at fixed times of the year—usually in July and August—in the holiday season in fact. It has seldom fallen to my lot to get abroad before the last week of June, when the first flight of most of the southern species of the plains is over. And this year I did not leave London before July 1st.

For some time past I had had my entomological eye, so to speak, fixed on the western Dauphiny, that is to say, the country west and south of Grenoble, between the Isère and the Drôme, and within the departments bearing the names of the respective rivers. An application to the Cyclists' Touring Club of France for information of this region brought me among other fascinating



booklets that published by the "Syndicat d'Initiative de Valence-sur-Rhône et de la Drôme." A glance at its contents decided me to try the country known collectively as the Vercors, and a cyclist friend having passed through the Lans valley earlier in the summer and given satisfactory account, I took the morning tourist-car from Grenoble on July 2nd, one of the many now "doing" the Alps and outlying "massifs" in connection with the P.L.M. and Sud Railways. By these means rapid communications have been opened up with well-known entomological centres, and a vast region of new country placed within easy reach of the main lines. But after five weeks' experience of them I cannot say that I view the automobile alpine—by the way the Academy is divided as to whether it is masculine or feminine—as an unmixed blessing. From the tourist's point of view the cars travel far too swiftly—it is impossible to enjoy the scenery; while at present many of the mountain roads are wholly unfit for motor traffic, and the shaking amounts to positive torture of mind as well as of body. For when the setting boards are full the anxious collector is speculating all the time how many pins have got loose in the boxes, and trembling for the fate of his rarities. On several occasions, notably on the road from Barcelonnette to Prunières, the railway station on the Briançon line, irreparable damage was done in the way of broken antennæ and split wings. Those who do their setting, as I do, *en route* will do well, therefore, to examine the boards before and after any involuntary game of Cup-and-Ball of the kind. Further, the turns and twists of the mountain roads, bad enough in the old diligence days, are nerve-shattering at the pace taken by the French chauffeur; and, worst of all for the entomologist, except when going slow uphill, the delight of spotting species by the roadside is destroyed; even more so of the occasional walk ahead with net or pill boxes by footpath short cuts, while the horses toil round the dusty zigzags. It was really quite a relief when, on one occasion at least, I found the motor, for want of passengers, superseded by the decayed and decrepit diligence, otherwise consigned to indefinite æstivation. But against these drawbacks may be reckoned the rapidity of the journey. Localities formerly reached in a day's drive are now but a few hours distant. While the completion of the Annot tunnel on the Digne-Nice line has at length united by rail and motor the Basses-Alpes and the Alpes-Maritimes. In the "fifties" it took Bellier and Guillemot two days and two nights in the diligence from Grenoble to Larche. The journey, with intervals, now occupies barely twelve hours.

The Vercors may be reached either from Valence or Grenoble, the usual starting point being Pont-en-Royans; but wishing to explore the Lans valley, as well as to see something on foot of the Gorges of the Bourne, to which the road leads through



Villars, I chose the longer route. From Sassenage the road is all up-hill, with steep gradients, and, as the motor slowed down, I was able to see something of the larger butterflies at all events on the flowery banks and rocky promontories through which we wound. The morning was fine; the sun full on the slopes below the Gorge d'Engins, and butterflies were in force with *Satyrus cordula* (males) in the ascendant, and very soon the familiar *Erebia stygne*. Occasional *Parnassius apollo* sailed lazily down the gullies, and the "blues" were represented by *Plebeius argus* (*ægon*). *Aporia cratægi* swung from the ox-eyed-daisy-heads as we topped the Gorge and entered on the long, green, highly cultivated valley of the Lans, and there even the "whites" became scarce until we reached the charming little country-house Hôtel du Parc, where I put up for a couple of days; nor should I have pressed on so soon had not the weather, from warm and sunny, changed suddenly to cool, with much cloud hanging low upon the hills I had hoped to climb. Flying down the road on the afternoon of the 2nd I saw one freshly emerged *Papilio machaon*—the only one of its kind met with until the very end of July—while a stroll towards the Gorges of the Bourne brought me to much promising ground, the waste places gay with the flowers of a fine red thistle-like *Centaurea*, usually most attractive to my game. The next day, therefore, I walked down the Gorge, which is singularly beautiful with its forest and rushing stream, as far as the bridge where the road divides, that to the left towards St. Martin-en-Vercors, that to the right towards Pont-en-Royans.

The weather was all against collecting, but before mid-day there were fitful gleams of sunshine, and at one or two points by the roadside butterflies were flying, but difficult to reach owing to the extreme steepness of the slopes, which, by the way, were rosy with an abundance of ripe alpine strawberries. *Erebia stygne* was the commonest insect with *A. cratægi*, and on one small patch, full of wild balsams not yet in flower, *Euchloë cardamines* and the spring form of *Pieris napi* were surprisingly fresh, in contrast to *Brenthis euphrosyne* and *Pararge hiera*, both of which species had seen their best days; a small dark race of *P. mæra* evidently just emerging. One fresh male, *Melitæa dictynna*, was put up among some raspberry bushes, where *M. athalia* also occurred singly. *Aglais urticæ* and *Pyrameis cardui* showed the hibernators and their progeny overlapping. The Lycænids were *Polyommatus icarus* and (one) *Lycæna arion*. But it was now so cold and the wind so high that I had to give up collecting; the only other butterflies observed being *Thymelicus flarus* (*thaumas*), *Chrysophanus dorilis* var. *subalpina*, and one male *C. virgaureæ* picked up crushed on the gravel path in front of the hotel. July 4th was equally windy and cool—fine without sun—and the mountains still canopied with

cloud, so that I had little hope of achieving much in the way of a bag on the path to the Col Vert—a mountain walk decidedly reminiscent of the green unproductive Plombs of Cantal, described by me in the 'Entomologist' (vol. xlii. p. 266), the similarity being heightened by the clumps of golden *Genista sagittalis*—a food-plant by the way of *Nomiades cyllarus*, as M. Rehfous tells us.\* The presence of innumerable herds also warned me of what I might expect, and the few butterflies met with, chiefly *Cœonympha pamphilus* and *Cupido minimus*, were actually kicked out of the herbage. Waking next morning to the same depressing weather conditions, I took advantage of the motor for Pont-en-Royans, which makes the tour of the Gorges, and after an interesting and exciting journey found the sun shining brightly upon the most picturesque of riverside towns. Thence the road mounts by the Petits Goulets to the Grands Goulets, and on to Baraques, where I spent the rest of this and the succeeding day with decidedly better results. Here there is plenty of excellent collecting ground towards the northern entrance to the Gorges, as well as between Baraques and La Chapelle-en-Vercors, whither I was bound; and I only regret that time prevented my making a longer stay, and that I had not been able to include Pont-en-Royans itself in the plan of campaign. *Agriades corydon* males were flying on the dusty road outside Pont-en-Royans, and *Parnassius apollo* was soon in evidence; *S. cordula* and *E. stygie* common at the gates of the Grands Goulets in the Vallée d'Echevis on the 5th and most of the 6th under a hot sun. Both *Thecla ilicis* and *T. spini* pervaded the low sloe-bushes, with decidedly *passées* *P. podalirius* females evidently ovipositing, and rather worn occasional *Limenitis camilla*. *Cœonympha arcania*, *Aphantopus hyperanthus*, *Pararge megæra*, and *Melanargia galatea*, were all common and fresh; the first perfect males of *Satyrus hermione* basked on the warm rocks and feasted upon the usual dainties! Brilliant *G. rhamni* affected the same small coppices by the roadside, and a large tawny-winged butterfly which flew into my net proved to be a newly emerged male *Eugonia polychloros*.

An even better terrain for butterflies, however, lies about a mile and a half out of Baraques on the road to La Chapelle, my next objective. At this point the mountains descend in easy slopes to the road, and there is an abundance of shrub and flora; the same red *Centaurea*, as before mentioned, again proving a most effective lure for many species. Following a cart track up the hill I was soon at work on what should have been a most productive locality if only the sun had obliged. The afternoon was far advanced before it came out at all strongly, and then nearly everything had gone to roost. The morning of the 7th

\* 'Bull. Soc. Lépid. Genève,' vol. ii. fasc. 4, p. 241.

did however yield an hour or two of warmth, and whenever the sun broke through for a minute or two butterflies became tantalisingly profuse. I was especially anxious to investigate the Hesperids of Drome, but though I worked hard at this point and quartered every acre of the likely-looking ground, I only succeeded in netting one of the elusive Black-and-White Skippers which whizzed past me at long intervals, but seemed never to rest upon the wing and to disappear like magic the moment the light failed. This one example is of considerable interest all the same. It is a splendid male *Hesperia alveus*—a true mountain species as we now know, and entirely different from *H. armoricanus*, the “*alveus*” of the plains as heretofore supposed. The coloration of the under side is also quite different to that of my Pyrenean and Swiss Alpine examples, the ground tint being deep rich green and not yellow- or olive-green, in this respect resembling a single example of the same species taken by me last year at Herkulesbad. Another surprise was the first *Colias* captured—*C. phicomone*—a male, the largest I have seen; and this at the lowest altitude I ever encountered the species—about 3000 ft. (Mr. Wheeler places the range in the Central Alps from 4000 ft. to 8000 ft., but mentions one even lower record, 2240 ft., Oberstalden (Frey)). Of the Lycænids, *Polyommatus hylas* was the most distinguished—a few males—and *Aricia medon* (*astrarche*) the commonest; and the latter, if not actually abundant, at least flying together in some quantity. *Plebeius argus* males were also well to the fore, and there were plenty of *Lycena arion* males flitting with *M. galatea* over a little patch of wheat at the foot of the slopes, the blades swaying in the wind seeming also to have a peculiar fascination for *P. apollo* as it made a regular up-and-down hill flight. *C. hyale*, very swift on the wing, was common. But before noon the clouds were up, and the night at La Chapelle-en-Vercors, in the cleanest of little inns, so cold and grey, that I was again on the road south at five in the morning, bound for the Col de Rousset in the *voiture publique* which here, at all events, has not been snuffed out by the motor. At this time of day, with a dour sky and keen wind blowing, the road from La Chapelle to La Britière and Rousset at the foot of the Col seemed uninviting. From the latter village, however, the road becomes decidedly interesting, and with sun and blue sky later in the day would no doubt be productive, though it is still quite northern in character—forest-trees and flora alike.

Finally, plunging into a long tunnel, we emerged at the Refuge just below the actual summit of the Col de Rousset, and at a step we had passed from the cool beech forests and pallid verdure of the north to the true Midi of barren lavender-haunted mountains, and aromatic wastes presently animated with the myriad insect-life that moves and has its being under



the gracious influence of the sun. Above, a mist still hung over the topmost cairn surmounting the tunnel. Three thousand feet below lay Die glittering in the sun, and the sound of the bells of the incoming diligence, mingling with those of the herds on the dewy hill-pastures, was borne upwards with the wind of the morning which is the breath of Provence. An hour or so, with hot coffee and rolls, in the still chilly "gazebo" of the Refuge, and the sun was on the Col itself, and presently, as we moved downwards, the limestone ravines became alive with *Erebia stygne*, *Parnassius apollo*, and *Satyrus cordula*, *Argynnis adippe*, *Issoria lathonia*, *S. alcyone*; and in the lavender region "Blues" battling with the strong wind which now blew up thick clouds of dust until we were all as white as any Pierid of them all. Lower down, where the lavender and wild-thyme were in full blossom, *Colias edusa* put in an appearance; and I noted the first *Chrysophanus alciphron* var. *gordius* males, gleaming like jewels on the purple spikes of bloom with azure *A. thetis*, *P. hylas* and *A. escheri*, the richly-purpled "Blue" flying with them, being no doubt that latest of rediscovered Lycænids, *Agriades thersites*, though I did not recognize it at the time. I had hardly reached Die railway station, however, when a whirlwind of dust, precursor of a thunder shower, of exceptional violence enveloped me; and grateful, indeed, was the rain upon the parched Avenue du Chemin de Fer, as I endured it for a half hour in a fly-haunted, frowsy restaurant, before the train—the slowest "omnibus" surely that ever crept—bore me away to Veynes, and late in a warm night, now "full of stars," to Digne of many pleasant memories, entomological and otherwise.

LIST OF RHOPALOCERA TAKEN AND OBSERVED AT VILLARS-DE-LANS (ISÈRE), AND IN THE VERCORS (DRÔME):—G. G. = Grands Goulets. G. B. = Gorges de la Bourne. La Ch. = La Chapelle-en-Vercors.—*Hesperia alceus*, La Ch.; *Agriades sylvanus*; *Thymelicus lineola*, *T. flavus*; *Chrysophanus doris* var. *subalpina*, G. B.; *C. virgaureæ*, Villard, *C. alciphron* var. *gordius*, above Die; *Lycæna arion*, La Ch., G. B.; *Cupido minimus*, Villard, La Ch.; *Aricia medon*, G. B., La Ch.; *Polyommatus icarus*, *P. hylas*, La Ch.; *Agriades escheri*, above Die; *A. corydon*, Pont-en-Royans, *A. thetis*, and probably *A. thersites*, south side Col de Rousset; *Plebeius argus*, G. B., La Ch.; *Celastrina argiolus*, La Ch.; *Thecla ilicis*, *T. spini*, G. G., La Ch.; *Papilio podalirius*, G. G., *P. machaon*, Villard; *Parnassius apollo*, above Pont-en-Royans, G. G., La Ch., Col de Rousset; *Aporia crategi*; *Pieris brassicæ*, *P. rapæ*, *P. napi*, G. B.; *Euchloë cardamines*, G. B.; *Leptidia sinapis*, *Colias phicomone*, La Ch.; *C. hyalc*, *C. edusa*, Col de Rousset; *Gonepteryx rhamni*, G. G., La Ch.; *Pyrameis atalanta*, *P. cardui*; *Vanessa io*, La Ch.; *Aglais urticae*, *Eugonia polychloros*, G. G.; *Pararge mæra*, *P. hiera*, G. B.,



*P. megera* ; *Satyrus hermione*, G. G., La Ch., *S. alcyone*, Col de Rousset, *S. cordula*, above Grenoble, Pont-en-Royans, G. G., La Ch., Col de Rousset ; *Epinephele jurtina*, *E. tithonus*, La Ch. ; *Aphantopus hyperanthus*, G. G., La Ch. ; *Canonympha arcania*, *C. pamphilus* ; *Erebia stygne*, Gorge d'Engins, G. G., G. B., Col de Rousset ; *Melanargia galatea*.

(To be continued.)

## SOME NOTES ON THE LEPIDOPTERA OF LA SAINTE BAUME, VAR, S. FRANCE.

By Rev. F. E. LOWE, M.A., F.E.S.

### I. BUTTERFLIES.

WE spent part of our two last summers at La Sainte Baume in Provence, a neighbourhood little explored, I think, by English collectors. Our experience extended from June 24th to July 2nd in 1912, and from June 21st to July 5th in 1913. As a hunting-ground it proved a most interesting locality to the lepidopterist, both for butterflies and, more particularly perhaps, for moths.

The range of mountains known as La Chaîne de la Sainte Baume attains an average height of 2000 ft., and forms a bow-shaped ridge running nearly parallel with the Mediterranean. To the west the range terminates in the bold perpendicular mass of limestone known as the Pic de Bretagne (3129 ft.), just within the Department of Bouches-du-Rhône. From thence the mountains, with a slight curve to the north-east, run across the Department of Var, and come to a fine climax in the Pointe des Beguines (3362 ft.). After this the ridge rapidly declines in height, and merges in the generally hilly surface of this part of Provence. The north part of the chain, on which is the famous Grotto, from which the mountains take their name, is precipitous, making almost a straight line against the sky between its two extreme points. All the lower half of this side is clothed with what is claimed to be virgin forest. It contains few really fine trees ; but is exceptional in character for these regions. At the foot of the mountains extends the tableland known as the Plateau du Plan d'Aups, some 1800 ft. above sea-level. Here, immediately under the Grotto, is the Hôtellerie de la Sainte Baume, our headquarters.

The Hôtellerie deserves a few words to itself, both on account of the kindness of our host and hostess and also owing to its history. The building was originally a religious house in charge of the Dominicans, who were dispossessed by the Government in 1904. It was purchased by its present owners, largely with a

motive of preserving its religious uses. And to those to whom it appeals, there is an extraordinary charm in the devotional atmosphere surrounding the place. For centuries it has been a sacred spot to the warm-hearted and highly imaginative Provençals. The centre of this feeling is a Grotto three-quarters of an hour walk above the Hôtellerie, in which, according to tradition, St. Mary Magdalene spent the last thirty-three years of her life in penitential devotions. This large cave has been transformed into a spacious church. At the back is a narrow natural platform in the rock, upon which the Saint is said to have performed her devotions, called Le Rocher de la Pénitence. Below is a reclining figure in marble of the Magdalene, a gift of the famous Mgr. Dupanloup. The Grotto has for centuries attracted annually great numbers of pilgrims, among whom have been both Popes and Kings. It is still in the present day the most highly esteemed goal of Provençal devotees.

There is a beautiful little modern chapel in the Hôtellerie, containing some good mural paintings. Here Mass is celebrated every morning, and all the staff and many of the visitors attend.

The Plateau du Plan d'Aups is reached by carriage and good roads, ascending in the usual sweeps and zigzags, either from Aubagne *via* Gémenos on the west, or *via* Nans from St. Maximin on the east. There is also another way from Auriol, joining the Gémenos road outside the village of Plan d'Aups.

The plateau itself, of curious geological formation, is a stony, arid plain, covered with stunted vegetation and a few small isolated fir trees: flowers, at least at midsummer, are few. The mountains of Sainte Baume wall it in on the south side, and corresponding hills of less altitude, and more irregular, on the north; at the east and west are deep valleys, through which the above roads descend. The north side of the plateau is curiously seared by irregular ridges of rock running from east to west, about which is a considerable growth of broom and scrub, often concealing dangerous holes and fissures between the up-standing rock. All this is good ground for "Hairstreaks," and "Blues" especially.

On the first two days the wind rather interfered with collecting, afterwards the weather was perfect. On June 22nd, therefore, I confined my work to the north side of the plateau where the shrubs and rocks afforded some shelter, and there were many warm corners. One of my first captures was an excessively small female *Chrysophanus alciphron* var. *gordius*. This insect, I fancy, is very far from common in this neighbourhood. I only took one other this year; that also a female. But their condition did not in the least suggest that the species was over. Last year I only took one male. *C. phleas*, the only other "Copper" seen, was also quite a rarity. Perhaps later broods would be more abundant. At this date *Thecla spini* was just

emerging, but became very common later. The specimens were not so large as those I have taken at Digne and La Granja ; more like the Rhone valley (Swiss) examples, but with the white line and blue spot on the under side more pronounced. *Thecla ilicis*, abundant, was generally worn ; and var. *esculi* perhaps commoner still, but I did not find *T. ilicis* var. *cerri*. Of *T. acaciæ* I was able to secure a few in fine condition and of large size ; still it was very scarce, and considerably more alert than its congeners. One is accustomed to see *Plebeius argus* (*ægon*) very abundant at times, but never have I seen anything like the multitude of this little "Blue" extending over so wide an area. They fly in numbers over the whole plateau, and hang from every grass stem. The males were all of the form we expect in the south, with shining silvery white under sides. The females showed some variety. They were pretty evenly divided between all brown forms, and others suffused in various degrees with blue, but in many cases in both forms there is a very fine but strongly defined white line on the upper side hind wing just before the fringe. I sent one or two of these to Mr. Wheeler for inspection ; who writes : "The white line on the upper side hind wing is very remarkable. I have only noticed it hitherto in *medon*, and it is hardly so marked in any specimens I have ever seen, even of that species." Of course, one effect of the white line is to throw up the orange chevrons into greater prominence. The orange in most cases (though not always) is continuous on both wings almost to the costa of the fore wing. In one beautiful brown specimen there is a series of small, but very distinct, blue spots on the inner side of the orange marks, on the upper side hind wing, faintly suggesting the marking of *Orion* var. *ornata*. One other male aberration is destitute of all spots on the under side of fore wings, including the discoidal, except the outer row, thereby outdoing *Icarus* var. *icarinus* ; and in the lower wings the three spots nearest the anal-angle are long and elongated.

The next day I turned my steps towards the woods on the east, especially one protected by a notice "Chasse Gardée"—which I took not to exclude a butterfly net. Here I saw the first of a coming shower of *Gonepteryx cleopatra*, a male. Last year, by the way, I was rather surprised to see several females two or three days before a male appeared. *Melanargia syllius* had been not uncommon, but was much worn. The best thing was *Leosopis roboris* which appeared in increasing numbers during our stay. I saw no ash at Sainte Baume ; evidently the food-plant here is oak ; some German authors give also privet, and even elder. The specimens were finer than those of Digne, and the species much more abundant. *Brenthis hecate* also began to show itself on the edge of the wood, and *B. dia* was of exceptionally large size. I also got a very nice banded male of *Melitæa athalia*. All the *athalia* were dark, and very strongly



marked. *M. parthenie* was in its last stage of tattered garments. On the 24th *Limenitis camilla* was not infrequent on the road descending to Nans, and *G. cleopatra* (females) and *Satyrus aleyone* first appeared. On June 25th I made across the plateau in the opposite direction to climb the Col de Bretagne. I afterwards found that there is a much better path and much better sport by the forest under the mountains. All the way insects were most abundant. In one or two openings, or little meadows, which slope southwards from the edge of the wood to the plateau, I saw, I think, a greater number of butterflies than I have ever seen in an equal space—not excepting Swiss localities. *L. camilla* was specially noticeable. I have often seen *L. sybilla* in flocks, but never before *camilla*, though the latter is, I should say, a more widely distributed species.

At the top of the Col, just under the perpendicular mass of the Pic de Bretagne, *Polyommatus escheri* was well represented by strikingly fine specimens of both sexes. One female shot with blue was the first I have seen of this form. I sent it to Mr. Wheeler, who informs me that “this slightly blue form of female *escheri* is stated by Turati to be common in the Alpes Maritimes.” Mr. Wheeler further says that there is another form about as blue as *corydon* ab. *semisyngrapha*; this has been named *subapennina* by Turati, and is not very scarce on the lower slopes of the Apennines; and that he himself has taken one such at Fiesole, which he exhibited before the Entomological Society, London, in 1909. These, I suppose, are comparatively newly noted varieties, as I find no allusion to any *blue* forms of the female either in Staudinger, Rühl, Wheeler, or the new editions of Spuler’s or Berge’s ‘European Butterflies.’\* *P. escheri* was to be taken all over the district, but it was on the Col that it evinced the greatest beauty of form. In this walk *Pyrameis cardui* was often to be seen, six and eight at a time. *Agriades thetis* (*bellargus*? *adonis*?) was also there, both worn and in good order. The males generally large and of a deep blue, rather of the lilac tone of colour, and frequent among them ab. *puncta*, Tutt. Last year I had taken a very beautiful male hybrid, *polonus*, and hoped, but in vain, to renew my good fortune this year. A few ragged *icarus* were to be seen, and a

\* The *Polyommatus escheri* of the Bouches du Rhône has a special form, and, though not so large as Andalusian examples, is generally larger than those found on the Central Alps. M. Oberthür makes special mention of the female form (Lépid. Comparée, fasc. iv. p. 214), to which he has given the name var. *foulquieri*, after M. Gédéon Foulquier, of Marseilles, who, with Dr. Siepi, has done so much to introduce lepidopterists to the fauna of this interesting region. I do not think either of them report the form analogous to *syngrapha*; but the “slightly blue” form is not uncommon in the hill districts of the south-east. I have myself taken it at Nyons (Drôme), Allos (Basses-Alpes), and St. Martin-Vésubie (Alpes-Maritimes); and, in the words of M. Oberthür, these, like var. *foulquieri*, “montrent près du corps, des atomes bleus.”—(H. R.-B.).



new brood began to appear before we left, but I should say the species was not very abundant. The same remarks apply to *Cupido minimus* and *Nomiades semiargus*; while of *Aricia medon* (*astrarche*) I saw but one, freshly emerged, near Nans at the end of my visit.

While writing of the "Blues" I will here make a leap of a few days. On June 30th we moved down to the Hôtel de Lorges, near old Nans, at the foot of the road ascending to the plateau of Plan d'Aups. This hotel is some 800 ft. lower down than the Hôtellerie. Late in the afternoon my wife and I, after having taken rooms and arranged our baggage, went for a short stroll. She called my attention to what she thought to be a strange form of *corydon* at rest. I caught it and pill-boxed it, but could only see the under side, which looked like a somewhat unusual *P. meleager*. When killed it proved to be a typical male *Dolus*. Of course on the next day we were on the look-out for more, but it was not until two days later that it turned up again, and then not on the same ground. The first specimen was taken on the rocky sides of the hill upon which the ruined château stands, but the rest were taken in the clearings of the wood and edges of fields skirting the wood. On July 6th I got six males and four females, and Mrs. Lowe two of each sex. In this locality *Dolus* presents the double interest of affording specimens both of the type and of var. *vittata*, usually assigned solely to the Department of Lozère. I left before the species was fully out, but my captures show of the type eleven males and seven females, against five males and one female var. *vittata*. It must be noted, however, that some of these reckoned of the type form have a decided tendency to the streak on the upper side hind wing which distinguishes the variety. They might be called var. *intermedia*. This is particularly true of certain of the males.

All former specimens in my cabinet came from Florac and Mende, the gifts of Mr. Jones and Mr. Rowland-Brown, and are of course var. *vittata*. On comparing these with this year's catch at Nans, it is at once evident that the Nans specimens are on an average considerably larger than those from the Mende district—a much darker blue, and also have a very much broader black edge to the wings. It is quite easy to pick out a Nans specimen if you mix them together.

*Agriades corydon* began to appear on July 2nd at Nans, and came out very slowly—the males with rather dark and sharply defined margin; the females did not show up before we left. I took one very beautiful example of var. *cinnus*.

One fine female, *Libythea celtis*, was taken between Nans and Sainte Baume off flowers of bramble. But I never saw another, neither could I see any plants of *Celtis australis*. At Sainte Baume *Satyrus alcyone* had appeared on June 24th; at Nans,

*S. hermione* came to hand with wings hardly dry on June 30th. Of the Argynnids *Brenthis hecate* was fairly common and widely distributed. *B. dia* passing, but had been remarkably fine and very common. Of the big brotherhood, *Argynnis niobe* var. *eris*, was the first to be seen, and not common; next *A. adippe* and *A. aglaia*; and, lastly, *Dryas paphia*; these would all be doubtless common later.

The little *Cœnonympha dorus* was very local, and never abundant; *C. arcania* not in great numbers. *C. pamphilus* gave me several nice forms, two var. *bipupillata*, one fine ab. *thersites*, and, lastly, a beautiful female, in which the round spot towards the apex of fore wings is of enormous size, with white pupil on under side 3 mm. in diameter, or the exact size of the letter O in Queen Victoria's name on a florin of 1890. This aberration I have decided to call *glaucoptis*, until I hear that it has been named before.

Before leaving on July 5th I had an hour or so in the immediate neighbourhood of our hotel, and was lucky enough to take a very perfect aberration of *Melitæa didyma* (female). These things are difficult to describe, and one is very conscious of M. Oberthür's reasons for demanding a figure of all named varieties. The striking feature of this specimen is the wide expanse of clear colour on the disk of all wings, devoid of the usual black markings. It is yellow of the lightest *occidentalis* forms, and the fore wings have no central markings whatever between the single sharp zigzag black edge of the fringe and two basal spots, which are open rings; above these, next the costa, are two open marks which form the figure 30. The lower wings are of the same ground colour as the upper, and all black marks are gathered together in a central band formed by wedge-shaped dashes. On the *under side* the primaries, which are of a darker reddish tint than on the upper side, are traversed by a central band of seven black dashes. The secondaries, of a pale cold yellow, have the central light band strongly defined between rows of large black spots, after which the wing is self-coloured up to the black line before the fringe. I have given to this, in honour of the locality, the name ab. *magdalena*. The following is the complete list of butterflies from Sainte Baume district noted by me, seventy-four in all, exclusive of varieties.

PAPILIONIDÆ.—*Papilio podalirius*, *P. machaon*.

PIERIDÆ.—*Aporia crategi*; *Pieris brassicæ*, *P. rapæ*, *P. napi*; *Euchloë belia* var. *ausonia* (one); *Leptidia sinapis*, scarce; *Colias edusa* and var. *pallida* (one), *C. hyale*, scarce; *Gonepteryx rhamni*, *G. cleopatra*.

NYMPHALIDÆ.—*Limenitis camilla*; *Pyrameis atalanta*, *P. cardui*; *Eugonia polychloros*; *Polygonia c-album*; *Euranessa*

*antiopa*; *Melitæa phæbe*, *M. cinxia* (one), *M. didyma*, *M. athalia*, *M. parthenie*; *Argynnis niobe* var. *eris*, *A. aglaia*, *A. adippe*; *Dryas paphia*; *Brenthis hecate*, *B. dia*, *B. euphrosyne* (one worn).

SATYRIDÆ.—*Pararge egeria* var. *intermedia*, *P. mæra*, *P. megera*; *Satyrus hermione*, *S. alcyone*, *S. circæ*; *Hipparchia semele*; *Epinephele jurtina*, *E. pasiphæ*; *Cænonympha pamphilus* and vars. *C. dorus*, *C. arcania*; *Melanargia syllius*, *M. galathea* var. *procida*.

LIBYTHEIDÆ.—*Libythea celtis*.

LYCÆNIDÆ.—*Chrysophanus alciphron* var. *gordius*; *C. phlæas* and var. *eleus-cæruleopunctata*; *Cupido minimus*; *Nomiades semiargus*; *Polyommatus dolus* and var. *vittata*, *P. hylas*, *P. escheri*, *P. icarus*; *Agriades thetis* and *hyb. polonus*, *A. corydon* and *ab. cinnus*; *Aricia medon*; *Plebeius argus*; *Celastrina argiolus*; *Leosopis roboris*; *Thecla spini*, *T. ilicis*, *T. esculi*, *T. acaciæ*; *Callophrys rubi*; *Zephyrus quercus*.

HESPERIDÆ.—*Erynnis alcææ* (one); *Hesperia carthami*, *H. alveus* var. ?\*; *Pyrquus sao*; *Thymelicus actæon* common, *T. lineola*, *T. flavus*; *Pamphilus sylvanus*.

## NOTE ON THE OVIPOSITION OF *RHYSSA*.

By L. N. G. RAMSAY, M.A., B.Sc.

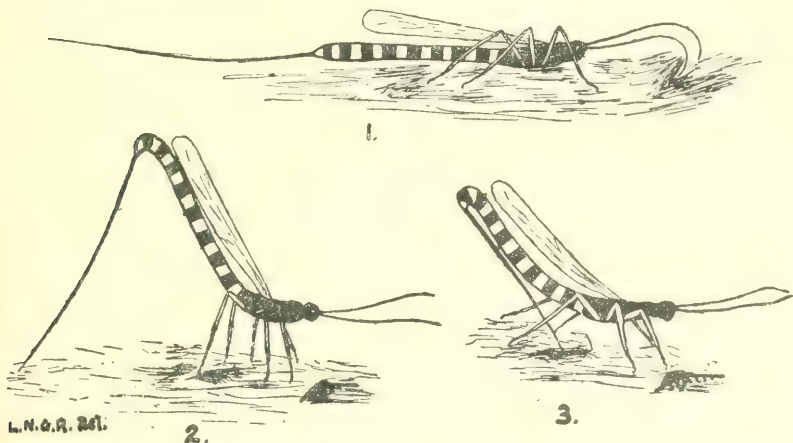
THE remarkable insects of the genus *Rhyssa* have for long been known to prey on the wood-boring larvæ of Siricidæ, introducing their eggs into the tunnels of the latter by means of their enormously elongated ovipositor. The ovipositor is sometimes even found sticking in a *Sirex*-infested log (as, for example, the specimens exhibited in the insect gallery at South Kensington), but, I understand, the manner in which the insect contrives to insert this unwieldy appliance into the tree-trunk has not hitherto been fully described. I hope, therefore, that the following account may be of interest to entomologists.

The event described was witnessed in the summer of 1909, while I was staying in the southern part of the Black Forest, to the west of the Wehratal. On the afternoon of August 29th, while skirting a wood—the very finest conifers of the Black Forest flourish in this locality—I happened to pause beside a pile of small pine-logs, and as I stood there one of these extraordinary insects appeared and settled on one of the logs. I will quote verbatim from my notes written the same day:—"It sat still for some time, and then began to walk about, feeling every hole and

\* Probably *H. bellieri* var. *foulquieri*.—(H. R.-B.)

corner in the rough bark with its long antennæ. After a minute or two of this it stopped, and drew up its long body, doubling the long black ovipositor underneath itself; it had to hitch itself up several times before it got the long needle into position underneath, with the tip in a crevice. Then it gripped the bark with its claws and gradually thrust the ovipositor about half an inch into the bark, then suddenly flew away, perhaps because it had completed laying the eggs, perhaps because I had gone too close. . . . ."

Immediately after, I made the rough sketches of the beast which accompany this note. These are probably a little larger than life, although the insect was a very large one. I noted that the abdomen was black and white, the legs pale, and the antennæ black.



EXPLANATION OF FIGURES (diagrammatic).—1. The insect reconnoitring the bark with its antennæ. 2. Getting the ovipositor into position. 3. The insect just before flying away; the ovipositor thrust home in a crevice. (Sketched from life.)

At the time I was unaware of the insect's identity, but on seeing the specimens of *Rhyssa* exhibited at the Natural History Museum this year, I at once recognised my old acquaintance, and comparison of the other species of the genus in the cabinet collections there leaves little, if any, doubt that this was *R. persuasoria*.

The figures will help to indicate the manner in which the insect succeeded in bringing its unwieldy ovipositor to bear on the log. As mentioned above, these were drawn before I left the spot (with the exception of the second, which I have added now to make the action clearer), and they are reproduced without any change from my original rough drawings. As the insect



had already taken its departure, they are necessarily crude, as it was the only example of its kind on which I had ever set eyes. For this and for their obvious artistic defects I shall make no further apology, as they are merely intended to convey the manner in which the insect accomplished its object.

Sharp\* figures (after Riley) the allied genus *Thalessa* in the act of oviposition, and states that in both these genera the ovipositor "is brought into use by being bent on itself over the back of the insect, so as to bring the tip vertically down on to the wood, through which it is then forced by a series of efforts; the sheaths do not enter the wood."

It is evident that this description does not tally with the foregoing observations on *Rhyssa*. The insect figured by Sharp follows his statements in having its long ovipositor bent on itself, out of its normal and approximately straight form, into an almost complete circle. From purely physical considerations, is it not a little difficult to understand how a non-muscular structure could be curved at will in this way? The possibility suggests itself to the present writer that the insect there figured, after having inserted its ovipositor in the manner described in this note for *Rhyssa*, may have pivoted its body through an angle of 180° around the flexible fixed ovipositor, in its efforts to thrust the latter into an unusually resistant piece of wood. This might easily happen through the insect's shifting its feet again and again to obtain a better purchase, and would explain the whole matter very simply, as the ovipositor in such a case would naturally assume the position figured.

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[There can be no doubt at all that Mr. Ramsay's notes refer to *R. persuasoria*, L., which has an extremely wide distribution through Europe to Canada and the United States in the West, and the Himalayas in the East, since it is to the best of my knowledge the only species attacking pinetophagous larvæ. *R. approximator*, Fab., is said by Holmgren to attack *Xyphydria prolongata*, which feeds in oak; and there are several interesting accounts of the American species' economy (Canad. Entom. xi. 1879, p. 15, &c.) and Harrington has (*l. c.* xix. p. 206) put on record "The Nuptials of *Thalessa*." Mr. Ramsay appears to take it for granted that these insects bore for themselves an egg-passage through the solid wood; but it is by no means proved that they do not oftener introduce them along the tunnel of the host larva (*cf.* Morl. Ichn. Brit. iii. p. 25, et Revision Ichn. Brit. Mus. ii. p. 10).—CLAUDE MORLEY.]

\* 'Cambridge Natural History, Insects,' pt. i. p. 554, 1895.

A MONOGRAPH OF THE GENUS *OSPRHYNCHOTUS*, SPINOLA.  
Family ICHNEUMONIDÆ: Subfamily CRYPTINÆ: Tribe CRYPTIDES.

By CLAUDE MORLEY, F.Z.S., &c.

THIS genus has been twice excellently described; in the first place, by Spinola (Magaz. de Zool. xi. 1841, p. 45), and later, in ignorance of any previous knowledge of it, by de Saussure (Distant's 'Naturalist in the Transvaal,' 1892, p. 229, under the name *Distantella*), though neither author assigned it a very definite classified position. That it is distinct from *Acroricnus*, Ratz. (= *Linoceras*, Tasch.), I am able to state from an examination of the typical species of both genera; Dalla Torre treated Ratzeburg's genus as synonymous, but Schmiedeknecht in 1904 correctly tabulated the palæarctic kinds under *Acroricnus*, which differs from *Osprhynchotus* in possessing two strong metanotal transcarinæ in place of only a subbasal one, in having the hind tibiæ normal and not incrassate throughout, in its lack of central setæ beneath the hind onychii, in its less compressed abdomen, posteriorly broader head with less excavate frons, in its centrally intercepted nervellus; but most especially in having the mouth parts but slightly produced, whereas in true *Osprhynchotus* species they are rostriform, with both cheeks and clypeus no shorter than the face, surmounted by strongly exerted labrum and ligula, extending in all to three and a half millimetres below the scrobes in the typical species. "*Osprhynchotus*" *peronatus*, Cam. (Entom. 1902, p. 182; placed in "*Linoceras*" by its author at 'Spolia Zeylanica,' 1905, p. 97) is an *Acroricnus* and very common in India, whence I have seen it from the Khasi Hills, Simla, Labatach, Sikkim, Shillong, and the Kangra Valley. I may be permitted to here bring forward the unknown female of *Acroricnus syriacus*, Mocs. (Magy. Akad. Term. Ertek. xiii. P. 11, 1883, p. 12, male), which differs from the male in little but its terebra, and this is as long as the abdomen, excepting the petiole; it is a true member of that genus and was captured by Escalera during 1900 at Kuh Sefid in south-west Persia.

The large size and nigrescent or brunneous wings of *Osprhynchotus* render it one of the most conspicuous genera of the Ichneumonidæ. That considerable confusion has existed concerning the synonymy of the species is owing to the fact that Brullé, in my opinion, described an extremely rare one in 1846, and that Tosquinet mistook it for the commonest in 1896.

W. A. Schulz's remarks upon this genus (Zool. Annalen, 1911, pp. 35-37), all the species of which he there wishes to regard as synonymous, appear to have been based upon insufficient material; he professes to have seen five examples of my last species, thirteen of my first, and an unrecorded number united under my second to fourth. Among these he failed to

discover any plastic distinctions sufficient to justify specific rank (though I consider the difference in shape of the areolet and brachial cell to be constant), and thinks the "distribution of red-brown colour varies greatly, apparently according to individual developement"; to me this variation appears very slight, and that of the hind tibial colour even less so. The synonymy of the whole genus is repeated in the same critic's "Zweihundert alte Hymenopteren" (Berl. Ent. Zeit. 1912, p. 63), where *O. violator*, Thunb., alone is allowed to stand, though far antedated by *O. objurgator*, Fab., as I pointed out in 1909.

#### TABLE OF SPECIES.

- (8). 1. Wings, basal abdominal segment and part of thorax black.
- (3). 2. Areolet externally subrectangular above; brachial cell apically less explanate; anus pale; flagellar pale band usually six-jointed. 1. *violator*, Thunb.
- (2). 3. Areolet externally rounded above; brachial cell apically strongly explanate; anus black; flagellar pale band usually four-jointed.
- (5). 4. Propleuræ and temples utterly glabrous; hind tibiæ white only to their centre. 2. *objurgator*, Fab.
- (4). 5. Propleuræ striate and temples pilose; central hind tibial flavous band extending far beyond centre.
- (7). 6. Hind tibial black band longer than calcaria: length 27 mm. 3. *gigas*, Kriech.
- (6). 7. Hind tibial black band not longer; length 21 mm. 4. *ruficeps*, Cam.
- (1). 8. Wings brown, basal abdominal segment and nearly whole thorax red.
- (10). 9. Wings basally paler; flagellum and hind legs red and not pale banded 5. *pulcherrimus*, Kirby.
- (9). 10. Wings unicolorous; flagellum and hind legs black, pale banded 8. *flavipes*, Brullé.

#### 1. OSPRHYNCHOTUS VIOLATOR, Thunb.

*Ichneumon violator*, Thunb. Mem. Acad. Sc. Petersb. ix. 1824, p. 303; cf. Roman, Zool. Bidr. Uppsala, i. 1912, p. 288.  
*Osprhynchotus capensis*, Spin. Mag. Zool. xi. 1841, p. 75, male, female. *Distantella trinotata*, Sauss. Nat. Transvaal, 1892, p. 230, female.

Maximilien Spinola beautifully figures (*loc. cit.* pl. lxxv.) both sexes with details of the head and of the male abdomen, which latter is not apically pale; he regarded the genus as a "Sous-famille des Ophionides" and derived his generic name from the rostriform mouth; only three examples of both sexes were known to him, from the Cape of Good Hope. I have examined what Mr. W. L. Distant assures me is the type specimen of Saussure's elaborately described genus *Distantella*, and find it to be entirely synonymous with *O. capensis*, Spin.



This genus has since been employed by both Cameron\* and Schmiedeknecht, with the erroneous characters ascribed to it by Ashmead (Proc. U. S. Nat. Mus. 1900, p. 41), for very different insects, whose position is consequently untenable. Though Saussure records only a single female from Pretoria, there is a long series of (presumably) cotypes from that locality in Distant's collection, now in Mus. Brit.; the former was at a loss where to place the genus and adds, "Je ne crois pas pouvoir le placer, ailleurs que dans la tribu des Cryptiens." There are a score of females in Mus. Brit. found by Dr. Smith in 1844 in South Africa, in 1852 in West Africa, in 1859 at Knysna in South Africa, later at Sterkfontein, &c., in the Transvaal, Queenstown in Cape Colony, and in March, 1900, at Slievra, in Natal. I have also seen it from Bonnefoi, in the Transvaal, in the Deutsches Entomologisches Museum of Berlin.

## 2. OSPRHYNCHOTUS OBJURGATOR, Fab.

*Ichneumon objurgator*, Fab. S. I. 1781, p. 426; *Cryptus objurgator*, Fab. Piez. 1804, p. 79, female. *Osprynchotus heros*, Schlet. Ann. Soc. Ent. Belg. 1891, p. 33, female; Tosq. l. c. 1896, p. 248, male, female.

This species is described:—Head and thorax dull red and punctate; male face white; antennæ black, white-banded; abdomen black, smooth and shining, apically compressed; legs black, the front ones dull red with tibiæ dull stramineous, the hind tibiæ and sometimes their tarsi pure white-banded; wings infusate-violaceous; length, male 20 mm. and female 28 mm. All this, as I have already pointed out (Entom. 1909, p. 135), exactly agrees with the type of Fabricius's species, which is still preserved in the Banksian Cabinet in the British Museum. This species is extremely constant in the coloration of its hind tibiæ, and the score in Mus. Brit. all have pure white hind tibial bands, extending only to the centre, in both sexes. Schletterer's female was from the equator in the Congo, Fabricius's from "Africa æquinoctiali"; Tosquinet gives it a range through Togoland, the Cameroons and Senegal, to Sierra Leone; and it appears pretty constant to that latitude, for I have seen examples only

\* *Distantella pilosella*, Cameron (Journ. Bombay Nat. Hist. Soc. 1909, p. 729) is a true *Cryptus*, sensu Thoms., male. Of Cameron's other Indian species of *Cryptus*, *C. luculentus* (Entom. 1905, p. 85) = *tarsolencus*, Schr.; *C. himalayensis* (Tr. Ent. Soc. 1904, p. 106) = *Hedycryptus*—not a good genus—*filicornis*, Cam. (Zeits. Hym.-Dip. 1903, p. 299); *C. orientalis* (Manch. Mem. 1897, p. 16) = *obscurus*, Grav.; *C. nursei* (J. Bomb. N. Hist. Soc. 1906, p. 285) = *insidiator*, Smith; *Buathra*—not a good genus—*rufiventris* (Tr. Ent. Soc. 1903, p. 234) must be included and is probably hardly distinct from *apparitorius*, Vill.; nor is *C. bibulus* (Tr. Ent. Soc. 1904, p. 106) from *C. albatorius*, Vill. *Cryptus indicus*, Cam. (Manch. Mem. 1897, p. 15) = *Mesoleptus annulipes*, Cam. (lib. cit. 1900, p. 103) = *Syzeuctus annulipes*, Morley, Fauna of India, Ichn. 1913, p. 236.—C. M.



from Sierra Leone in 1838 (Rev. F. D. Morgan), Sierra Leone (J. J. Simpson and W. G. Clements in 1893), Shengay in the north Sherbro District of Sierra Leone in 1910 (W. Addison), Kokona on March 26th, 1912, Giggema on August 22nd, 1912, Bunbumbo on August 15th and 16th, 1912, and Kamagbouse on April 6th, 1912; from Nigeria at Ilorin on June 3rd, 1912, Minna during 1911 (J. W. Scott-Macfie), and on October 18th, 1910 (J. J. Simpson), Oshogbo, in southern Nigeria, in 1910 (Dr. T. F. G. Mayer); from the Congo in 1843 (Dr. Richardson) and 1890 (Miss Sharpe); from the East Neave has sent several females from the Tero Forest, near Buddu, taken at the end of September, 1911, at 3800 ft., and near Kumi and Lake Kiogo at 3500 ft. in the Uganda Protectorate during the preceding August. The Deut. Ent. Museum has it from Togo and the Cameroons.

### 3. *OSPRHYNCHOTUS GIGAS*, Kriech.

*Osprynchotus gigas*, Kriech. Mem. Accad. Sc. Bologna, iv. 1894, p. 86, female.

This I believe to be the commonest species of the genus. It is described:—Black; head transverse, posteriorly obliquely constricted and red with the facial orbits paler, fulvescent; antennæ black with scape red, and the eighth to twelfth joints pale fulvous; mesonotum rugosely punctate, and not at all red; metanotum rugose; scutellum somewhat convex, punctate, centrally subglabrous, with the prescutellar lateral laminae red-marked; abdomen glabrous and nitidulous, with terebra 12 mm. in length; front legs red, with infusate tarsi; the posterior black with a band, occupying about two-thirds of the hind tibiae, pale flavous; most of the apical half of the hind metatarsi, and whole of the second to fourth joints, concolorous; wings dark violaceous, with their apices broadly black; a subpellucid mark beyond the stigmal base, and three hyaline fenestræ in the disco-cubital, second recurrent and outer areolar nervure; length,  $27\frac{1}{2}$  mm. Kriechbaumer's above account is not very accessible and was overlooked by Tosquinet; I, consequently, give it in extenso from his part of the paper "Rassegna degli Imenotteri Raccolti nel Mozambico dal Cav. Fornasini."

I have seen a hundred and forty specimens of both sexes (the male differs in no way but its paler red capital colour) which agree exactly with this description from Abyssinia, British East Africa, Uganda, German East Africa, Nyassaland, Moçambique, Delagoa Bay, north and north-east Rhodesia, Natal; and a male in the Rev. T. A. Marshall's collection which is labelled "Senegal," but several of his African localities were incorrect, and the present species seems rare or wanting towards the east of the Continent. I have seen both sexes in the Deut. Ent. Museum from Three Sisters, near Barberton, in the Transvaal, where they occurred during October and December.

## 4. OSPRHYNCHOTUS RUFICEPS, Cam.

*Osprynchotus ruficeps*, Cam. Ann. S. African Mus. 1906, p. 142, female.

Male and female. A black species, with flagellar band stramineous; female with head, under side of scape, and most of prothorax red; male with face, under side of scape flavous, thorax black; both sexes have the hind tibiae flavous with extreme base, and a band at their apex not longer than their calcaria, black; hind tarsi flavous with a band at their base shorter than the calcaria, and onychii, black; wings violaceous; length, 21 mm., terebra, 10 mm. I greatly doubt if this species be aught but a small and southern form of the last; Cameron did not know *O. gigas*, Kriech., and the present species seems separable from it only in its smaller size and narrower black hind tibial band. It was described from the Umvoti River in Natal; and I have seen a dozen examples, agreeing in the above characters, from East Karoo, in Cape Colony (A. Howarth), Port Natal, in 1856 (Mr. Plant), Howick, in Natal (J. Cregoe), the Transvaal on November 29th, 1896 (A. Ross and A. J. Cholmley, 1906), Johannesburg and Sterkfontein (H. P. Thomasset), and Pretoria (Distant).

## 5. OSPRHYNCHOTUS PULCHERRIMUS, Kirby.

*Cryptus pulcherrimus*, Kirby, Bull. Liverpool Museum, iii. 1900, p. 14, and 'The Natural History of Sokotra and Abdelkuri,' by H. O. Forbes, 1903, p. 237.

The type was taken at Homhil (one female) at 1500 ft. in Eastern Sokotra on January 23rd, 1899; and cotypes:—One female at Dahamish at 350 ft., in Sokotra, on December 24th, 1898; one female at Goahal Valley, in Eastern Sokotra, on January 16th, 1899, and one male at Thluteed at 1200 ft., in Sokotra, on January 15th, 1899. All these are in Mus. Brit. The lack of all black or red markings renders this species conspicuously distinct; its mouth is no less rostriform than in its congeners, and I was in error (Entom. 1911, p. 212) in ascribing it to the genus *Acrorichnus* *croricenus*, Ratz.

## 6. OSPRHYNCHOTUS FLAVIPES, Brullé.

Hist. Nat. Ins. Hym. iv. 1846, p. 135, female; (?) Tosq. Mem. Soc. Ent. Belg. 1896, p. 246, male, female.

This species was originally recorded from Senegal only; subsequently, Tosquinet, whose description looks like a compound of Brullé's and that of *O. gigas*, Kriech., adds such diverse localities as Togoland, Angola, the Cape, Tanganyika, the Congo, and Scioa, but I place no reliance upon his knowledge of the present genus. In my own experience, which is slender, this species is extremely rare, and has, I believe, been misunderstood by all subsequent authors. Schulz professes to recognize it from both Senegal and Senegambia. I have seen but a single

female, labelled "Gambia" in the British Museum, which would point to a range nearly as restricted as that of the last species; this female exactly agrees with Brullé's description in every way, especially in the red basal segment and the terebral length of twelve millimetres, not only eight as indicated by Tosquinet. The species referred to under the present name by Col. Bingham, (Trans. Zool. Soc. xix. 1909, p. 179) from Mount Ruwenzori, is *O. gigas*, which was at that time mistaken for it in the National Collection. The coloration of *O. flavipes* is quite distinctive:—Head, thorax, scape and extreme apices of antennæ rosy; the last with only two joints white; mesonotum and metanotum sometimes more or less, but never entirely, nigrescent; abdomen black, with the basal segment entirely red; legs ferrugineous with the hind femora, tibiæ and tarsi black, the basal half of their tibiæ and second to fourth tarsal joints very pale flavous; wings brownish, not at all nigrescent, but with violaceous reflection; length, female, 25 mm.

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## TWO NEW MYRMECOPHILOUS APHIDES FROM ALGERIA.

BY FRED. V. THEOBALD, M.A., F.E.S., Hon. F.R.H.S., &c.

THE two new Aphides described here were taken by Mr. P. A. Buxton and Mr. R. Gurney in ants' nests in Algeria; one of them was also found with termites. So far only a single aphid has been recorded from the nests of white ants, namely, *Termitaphis circumvallata*, Wasmann (Tijdschr. v. Entomol. xlv. 1902, p. 105, pl. 9, fig. 7, a-c \*).

Professor Robert Newstead informs me that he is describing another peculiar form from termite nests in the West Indies.

One of the two species described here is very marked, and this I have placed in a new genus for which I propose the name *Rectinasus*. The other comes in the genus *Forda*, although the adult female presents a somewhat different form to the other known Fordas. The ant hosts are given with the species described.

### Genus RECTINASUS, nov. gen.

Antennæ of five segments, long, often over half the length of the body, rather thin, the first and second segments small, of about equal length, third and fifth long, about equal in length, fourth short, slightly longer than the second, the first and second have a short blunt spine, at the apex and base respectively. Eyes small. Proboscis long, from two-thirds the length of the body to a little longer than the body, carried at a marked angle to the body, often nearly at right angles; acuminate, hairy. Setaceous mandibles and maxillæ long. Body segmented. Cornicles absent. Legs rather long and thin, but somewhat thicker in young forms.

\* This insect has since been placed in a new family.

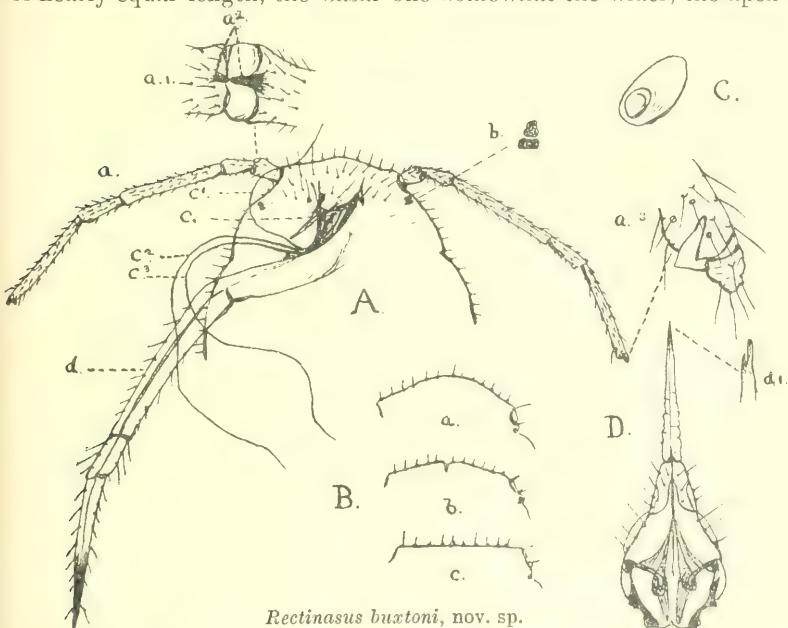
The marked characters of this genus are the antennæ and the projecting long proboscis.

The viviparous apterous female only known.

Found in company with ants.

*Rectinasus buxtoni*, nov. sp.

*Apterous viviparous female*.—Ochreous yellow to pale yellow and almost pearly white, pubescent; legs and antennæ brown; proboscis black at the apex, brown to nearly the base in some, paler in others. Eyes black. Frons more or less porrected. Vertex convex to flat, broad, hairy. Antennæ of five segments, the two basal ones small, of nearly equal length, the basal one somewhat the wider, the apex



*Rectinasus buxtoni*, nov. sp.

A. Head of apterous viviparous female; a, antennæ; a¹, joint of first and second segments, showing spines a²; a², apex of antennæ; b, eye; c, labrum; c¹, maxillæ; c² and c³, mandibles; d, proboscis. B. Variations in head a, b, and c. C. Lateral tubercle. D. Labrum, d¹ apex further enlarged.

of the first and base of the second with a small dark, blunt, median projecting process, pointed towards one another, third segment long, fourth short, but longer than the second, fifth as long as the third, ending in a short, blunt nail, a small round sensorium at the apex of the fourth and a peculiar shaped one at the base of the nail on the fifth; all the segments hairy, in some the antennæ are nearly as long as the proboscis, in others shorter. Proboscis carried at a marked angle to the body, bent near the base, acuminate, the apex of the last segment, which is long and thin, black, hairy; setaceous mandibles and maxillæ long; labrum moderately long, porrected, base with some hairs. The proboscis varies in length, usually about two-thirds the length of the body, but may be longer. Frons often porrected.



Pronotum constricted from the rest of the body, which is oval.

Abdomen with short hairs on the anterior three-fourths, longer ones behind with shorter ones between. Cauda rounded to cone-shaped, very hirsute, hairs long. Pore-like, oval, flat tubercles at the sides.

Legs rather long and thin, projecting; femora wider than the tibiae, tarsi of two segments, the basal one small, all the segments with fine short hairs.

*Length*.—1.5 to 2.3 mm.

*Habitat*.—Lambèse, Batna, E. Algeria.

*Time of Capture*.—April 5th, 1913.

*Notes*.—A large number taken in ants' nests (*Pheidole pallidula*, Nyl.), under the same stone as a nest of the termite (*Leucotermes lucifugus*, Ross), and three specimens from nest of *Bothryomyrmex meridionalis* by Mr. R. Gurney at the same time. The head varies somewhat in form; in some it is convex in front, in others flat, and some appear to have a median sulcus. The relative length of the antennæ and proboscis also varies; in young forms they are about the same length, in older ones the antennæ are considerably shorter than the proboscis. With regard to the connection with termites there is some doubt, for Mr. Buxton sends the following from his notebook:—"Ant, Aphis and Termite all under the same stone. The termites probably not in association, but ants and aphides actually in the same nest."

The termite has been determined by Holmgren as *Leucotermes lucifugus*, Ross.

*Forda rotunda*, nov. sp.

*Apterous viviparous female*.—Dull white above, much domed; flattened below, brown, the marked segments darkened apically.

Antennæ less than one-fourth the length of the body, thin, of five segments, the two basal ones short, about the same length, the basal one wider than the second, third segment the longest, slightly narrower than the second, about as long as the fourth and fifth together, the last two equal, a single round sensorium near the apex of the fourth and one large one and one or two small round ones at the base of the very short, blunt nail on the fifth, the last two segments brown, the rest yellowish, all the segments with fine short hairs.

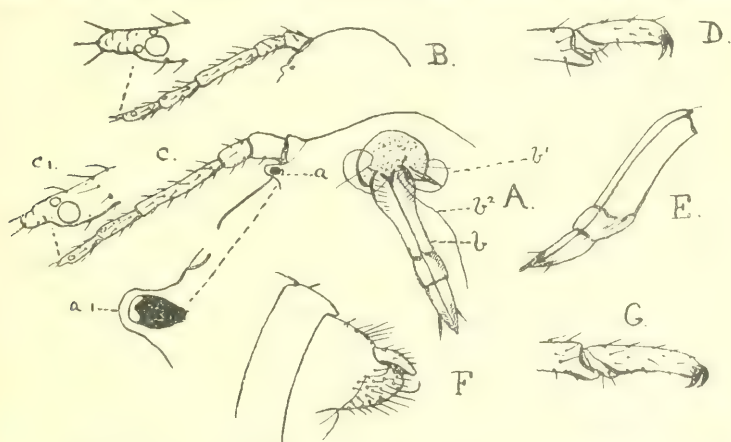
Eyes small and black, projecting from the side of the head. Vertex rounded or curved, nude. Proboscis short and thick, reaching just past the second coxæ, dark at the tip, with two sub-terminal setæ; setaceous mandibles and maxillæ rather short, the former spirally curled; proboscis bent under the body and more or less closely applied to it. A few hairs on the posterior of the body; cauda very hirsute, hairs curved apically; no trace of segmentation on the white domed dorsum which has the appearance of white kid; markedly segmented on the brown venter.

Legs brown, first and second pairs very short, the femora thick and nearly as long as the tibiae; tarsi of two segments, the same length in the first two pair of legs; third pair of legs longer, just

projecting beyond the body, femora much thicker and shorter than the tibiae; tarsi longer than in the two front pairs; the basal segment of the feet, small; tibiae and tarsi hairy, hairs very fine and short.

*Length*.—3 mm.

*Immature viviparous female*.—Colour varying from pale yellow to dull brownish grey. Legs pale yellowish brown. Antennae with the last two segments pale brown; two basal segments short, about equal length, the basal one broader than the second, the third the longest, about as long as the fourth and fifth, which are equal, a sensorium on the apex of the fourth and one at the base of the short blunt nail on the fifth, with two to four smaller ones surrounding



*Forda rotunda*, nov. sp.

A. Head of mature apterous female; c, antennae; c', further enlarged apex; b, proboscis; b', mandibles; b'', maxillae; a, eye; a', eye further enlarged. B. Head and antennae of immature female. D. Front tarsus. E. Proboscis. F. Lateral view of cauda. G. Hind tarsus.

it, all the segments with small hairs. Eyes small and black, not so projecting as in the adult. Proboscis reaching just to the third coxae, of similar form to the adult. Legs longer in proportion than the adult, well projecting from the body, otherwise similar. Cauda rounded, hairy, hairs long and curved apically.

*Length*.—2 to 2.5 mm.

*Habitat*.—Hammam Meskoutine, E. Algeria.

*Time of Capture*.—April 3rd, 1913.

*Notes*.—One mature female and four immature ones taken in ants' nests (*Tapinoma erraticum*).

There is no doubt that these are all one species, although the mature form looks very different, its swollen appearance, its white kid-like upper surface and flat brown venter with marked segmentation is very characteristic, the younger forms are more *Forda*-like, whilst the adult approaches a *Tycheoides* in appearance but the antennae are *Forda*-like. The hairy cauda is prominent in all.

The types of both species have been placed in the National Museum at South Kensington.

THE FOSSIL ORTHOPTERA OF FLORISSANT,  
COLORADO.

BY T. D. A. COCKERELL.

ORTHOPTERA are uncommon in the Tertiary rocks, and usually poorly preserved, although they must have abounded in former times as now. Probably most of the species were better able to escape destruction during volcanic eruptions than smaller and more fragile insects. The Miocene shales of Florissant have yielded no fewer than thirty-three species, and although this must be but a small fragment of the Orthopterous fauna of that time, it is sufficient to give us some idea of the types existing perhaps a million years ago. Two new species have been recently discovered by Professor Wickham, and are described below.

The Forficulidæ are represented at Florissant by the extinct genus *Labiduromma*, Scudder, with no fewer than ten species. Earwigs are the only Orthoptera in the shales which can be called common.

Blattidæ are represented by three genera still living in America, each with a single species. It is possible that the species referred to *Zetobora* is really an *Ischnoptera*, and identical with the described member of that genus.

The Mantidæ are represented by three species, referred to two genera, both believed to be extinct. Scudder has described one Phasmid, placing it in *Agathemera*, a neotropical genus still extant. In the Acridiidæ we find the apparently extinct genus *Tæniopodites*, Ckll. of the Acridiinae; three species of *Ædipodinae*; and three of *Tryxalinae*. All these Acridians, whenever their generic characters can be made out, seem to belong to extinct genera. In the Locustidæ we have *Palæorehnia*, Ckll., a remarkable extinct genus referred to *Phaneropterinae*; a very dubious member of the *Pseudophyllinae*; *Lithymnetes*, Scudd., an extinct genus placed in the Oriental and Australian group *Phyllopharinae*; a *Conocephaline* referred to the living genus *Orchelimum*; two *Decticinae*, belonging to the living genera *Capnobotes* and *Anabrus*; and two species of the widely distributed *Gryllacris*, of the subfamily *Gryllacridinae* (*Gryllacrinae*, Kirby, Scudder).

As the list stands, less than a third of the species seem to belong to modern genera, and it is quite possible that if we had complete specimens of these, at least some of them would prove to be incorrectly assigned. On the other hand, it may be that some of the genera described as extinct are still living. The whole matter must stand subject to future revision, should better materials be brought to light; but we can at least say this, that the Miocene Orthoptera of Colorado were, on the

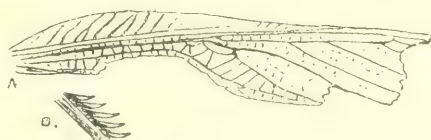
whole, strikingly different from the existing fauna of that region, and were like those of warmer regions to the south. The apparent resemblances in some cases to the Old World fauna may possibly be deceptive, but if they are not, they fall in line with the indisputable occurrence of such Old World genera as *Glossina* and *Halter*.

## ACRIDIIDÆ.

*Tyrbula scudderi*, n. sp.

Hind leg with femur  $17\frac{1}{2}$  mm. long,  $3\frac{1}{3}$  wide, superior carinæ strongly marked; many broad oblique brown bars, broader than the intervals between them. Tibia of same leg  $18\frac{2}{3}$  mm. long,  $\frac{1}{2}$  mm. wide, the hind margin with sixteen large, two medium, and four small spines, the uppermost (small) one  $3\frac{2}{5}$  mm. from base of tibia, the first large spine 7 mm. from base; the large spines formed as in *T. multispinosa*, but so closely set that their bases almost touch, and the longest spines are nearly  $1\frac{1}{2}$  mm. long; the longer spine at apex of tibia is about 1 mm. long. Tarsus 6 mm. long.

Tegmen as preserved about 29 mm. long, but if complete it would probably be about 32 mm.; width about 5 mm. A slight indistinct marbling, but no distinct spots or bands. Venation as indicated in



*Tyrbula scudderi*, Cockerell. A. Tegmen. B. Tibial spines.

the figure; the costal region broadly expanded, with oblique, rarely branching veins, much as in *Stirapleura texana* as figured by McNeill; the first subcostal branch must be very short, as it is not clearly visible, the base of the costal field being suffusedly brown without well-preserved veins; the rest of the venation shows a general resemblance to that of various Tryxalines, with the following peculiarities: radius branching about middle of tegmen, the branches continuing close together, joined by numerous cross veins, approaching in apical field, but diverging again, the lower branch giving off below at least three long oblique veins; media branching a little beyond the radius, the branches widely divergent, forming an open fork, but gradually approaching as they go toward margin; cubitus simple, ultimately joining first anal. In the figure the stems of the media and radius are too close together; with a good lens they can be seen to be distinctly separate, joined by numerous small cross-veins, but the media is only half as far from the radius as it is from the cubitus.

Miocene shales of Florissant, Wilson Ranch (*H. F. Wickham*). I make the leg the type, because it shows parts which can be compared with the descriptions of Scudder's two species of *Tyrbula*. The tegmen was on another piece of shale, but I



feel confident that it belongs to the same species. This is probably Scudder's supposed *T. multispinosa* from Florissant; but the true *T. multispinosa* is a different insect, from the Eocene of Wyoming. The Wyoming species is the type of the genus, and very possibly better material of it would indicate that the Florissant insects belong to a different genus.

#### MANTIDÆ.

##### *Lithophotina costalis*, n. sp.

Tegmen, as preserved (base and apex wanting), about 18 mm. long, actual length probably 25; pallid, the veins appearing light reddish, perhaps green in life; similar to *L. floccosa*, but with the costal field much larger (nearly 2 mm. broad near middle), and the inferior branches of the media not forked. The first superior branch of the radius is nearly 2 mm. before the apical fork (or origin of last inferior branch) of media. The subcostal vein is thin, but quite distinct, and is joined to the radius by oblique cross-veins, some having a sigmoid curve. The costal field is finely reticulated, agreeing herein with *Stagmomantis* and not with *Photina*. The width of the tegmen in middle is a little over 8 mm.

Miocene shales of Florissant, Wilson Ranch (*H. F. Wickham*).

#### REVERSION OF ARCTIC *EREBIA LIGEA* VAR. *ADYTE*, HB., AND ALPINE *PARARGE MÆRA* VAR. *ADRASTA* TO THE TYPE-FORM. HIBERNATION OF *PYRA-* *MEIS ATALANTA* AND *PARARGE EGERIA* VAR. *EGERIDES*.

BY H. ROWLAND-BROWN, M.A., F.E.S.

MR. WILLIAM CARTER, of Hamburg, has been good enough to furnish me with a copy and translation of a paper communicated by Herr August Selzer to the Entomological Society of Hamburg, which contains several items of considerable interest to those of us who study the bionomics of the western palæ-arctic butterflies. For some time in the arrangement of the genus *Erebia* considerable doubt appears to have existed as to the actual species of which Hübner's *adyte* is a variety. If any such doubt remains at the present, it should be finally dispelled by the results of the breeding experiments successfully carried through by Herr Selzer who, from ova obtained from Lapland *adyte*, has derived typical *ligea*.

*Adyte* was common enough at Abisko, Swedish Lapland, when I was collecting there in July, 1906 ('Entomologist,' xxxix. p. 247), and it was here, also, that Herr Selzer took the females from which he bred the typical form in Hamburg.

They were placed upon grass immediately, and commenced laying; the ova were kept out of doors, and the larvæ emerged in the February of 1911, being half-grown at the end of June, when they proceeded to æstivate. Reappearing at the end of August, they fed up and pupated, being now kept in a warm room. The first imago appeared on October 12th, the last on December 31st.

The larvæ differed considerably in appearance from the ordinary form of Harz *ligea*, being darker and plainly striped. In nature *ligea* ova lie over the winter, and Herr Selzer says that "the larvæ which emerge in the spring hibernate the winter following," an imago rarely occurring late in the summer; so that the life-cycle of the typical *ligea* of the Harz extends apparently through two years.

A comparison of *adyte* imagines from the Engadine and from Zermatt showed them to be identical with the Lapland form. Those in my own collection do not differ materially from examples from Cortina, the Brenner, &c., and, as I said before (*loc. cit.*) of the Abisko specimens, the superficial differences from the type are not marked in the male to any great degree. But those bred from Herr Selzer's Abisko ova were absolutely identical with the *E. ligea* from the Harz Mountains. Mr. Carter kindly sent me also a photograph illustrating in detail the results of this experiment, but, unfortunately, I am unable to reproduce it in this Journal, owing to the size of the block. It would be interesting to discover how far Lapland *adyte*, bred under natural conditions in Hamburg, would approximate to the type. But, as Herr Selzer claims, the contention as regards the specific identity of *adyte* and *ligea* may now be considered settled.

As throwing further light on the subject of type reversion, Herr Selzer proceeds to record his experiences with *Pararge mæra* var. *adrasta*. From females of this variety captured at Zermatt, sent to Hamburg for the purpose, ova were obtained, the larvæ still differing slightly from Harz typical form. But no difference was observable between the resulting imagines and the typical form. So that it may be inferred that the change back, due no doubt to altered conditions of climate and temperature, comes about in the pupal phase principally, as has been demonstrated, I think, by the experiments of Mr. Merrifield and others.

Two further notes by the same author, communicated to the 'Internationalen Entomologischen Zeitschrift' (No. 42, Jan. 18th, 1913, p. 293) on the subject of hibernation are also exceptionally interesting to British lepidopterists. Herr Selzer says that he found a freshly emerged *Pyrameis atalanta* at Heiligenhafen, on the Baltic, in the early part of June, and regarding this as an indication that the butterfly passes the winter in the pupal phase, he searched the same spot later in

the year for larvæ, found them, and through the winter of last year had live pupæ in his cages. He further tells us that of the larvæ of *Pararge egeria* var. *egerides* (usually single-brooded in the Harz) obtained from captured females in June, half fed-up and emerged in Hamburg in the following September, the rest pupating at the end of that month and in October, and in this phase hibernating for a spring emergence.

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## A NEW MOSQUITO FROM SAMOA.

By FRED. V. THEOBALD, M.A., F.E.S., &c.

### *Pseudotæniorhynchus samoensis*, n. sp.

Head brown, with narrow pale border around the eyes and pale line in the middle, a dark patch on each side; black upright scales all over the head. Proboscis almost black, with a median creamy band. Thorax deep brown, with somewhat marked median lines and two pale spots before the bare space in front of scutellum. Abdomen deep blackish-brown, unbanded except for a narrow pale basal broken band on the last segment, with basal, almost white, lateral spots; venter with third and fourth segments with basal pale bands, the fifth with a line of pale scales at the apex, others with traces of basal bands. Legs deep brown, narrowly banded, the bands mainly basal, but traces on the apices. Wings brown scaled.

♀. Head shiny blackish, with a few small pale narrow-curved scales and numerous upright black forked scales all over it, a line of pale narrow-curved scales around the eyes and small flat grey and dark lateral scales, a median nude line appearing pale; proboscis rather thick, black with a median pale creamy band, black chætæ ventrally at the base; palpi moderately long, black-scaled; clypeus deep brownish black.

Thorax black, with small, narrow-curved thin brown scales, very dense, two spots of similar but pale golden scales before the bare space in front of the scutellum, traces of two median parallel bare lines showing as dark lines, with two lines of paler hairs in the middle and others at the sides; lateral chætæ black, very dense over the wing-roots and a number on each side of the bare space passing back to the scutellum; scutellum paler, with small narrow-curved dark scales and long black posterior border-bristles, dense on the lateral lobes: metanotum brown; pleuræ black and grey with some small flat whitish scales.

Abdomen black, unbanded, with small basal creamy white lateral spots, which are prominent on the last segment, nearly forming a band; posterior border hairs pallid; venter with basal pale bands, the fifth with a white band near or on the apical border; on the sixth and seventh segments the basal lateral spots spread out along the sides of the segments to some extent.

Legs dark brownish black, the fore pair with a small apical yellow spot on femora and tibiæ and on the first four tarsals basal pale



bands; in the mid pair very similar, but slightly more prominent; in the hind the banding still more prominent, in all traces of it on the apices of the segments; femora and tibiæ with numerous black chætæ; unguis small, equal and simple.

Wings rather narrow, with dense brown scales, rather broad and straight with shorter and broader median vein-scales; first fork-cell longer but about the same width as the second fork-cell, their bases about level; stem of the first not quite half as long as the cell; stem of the second about half as long as the cell; posterior cross-vein much longer than the mid cross-vein close to it. Halteres with pale stem and large fuscous knob with pale scales, especially at the apex.

Length, 4·8 mm.

*Habitat*.—Apia, Samoa.

*Observations*.—Described from a single perfect female sent me by Dr. K. Friederiks, Government Zoologist of Samoa; two specimens were taken in a privy.

It forms a very marked species of *Pseudotæniorhynchus*, easily told by the brown thorax having no posterior pale spots and by the abdominal ornamentation. The type I have presented to the Liverpool School of Tropical Medicine.

Dr. Friederiks tells me the other mosquitoes found in Samoa are *Stegomyia fasciata*, Fab.; *Stegomyia pseudoscutellaris*, Thorp; *Culex fatigans*, Wied; and a species of *Mansonia* (i. e., *Tæniorhynchus*).

## SYNONYMY OF *ICHNEUMON OBLITERATUS* AND *I. BARBIFRONS*.

By CLAUDE MORLEY, F.E.S.

SOME time ago Dr. T. A. Chapman was so good as to present me with a female of *Ichneumon obliteratus*, Wesmael (Ichn. Miscellanea, 1855, p. 18), which emerged on August 21st, 1910, from the pupa of *Brenthis pales*, found at Furka, in Switzerland, on 28th of the previous month. When first describing the species, Wesmael knew but a single female: "M. le Dr. Kriechbaumer a pris cette femelle aux environs de Coire, en Suisse." Giraud (Ann. Soc. France, 1877, p. 398) says Fallou bred it—evidently still the female only—and adds in a footnote, "L' *I. obliteratus* provient de chenilles d'*Argynnis pales* prises en juillet 1866, autour de l'hospice du Simplon, dans le Valais," Switzerland. Berthoumieu in 1894 simply epitomises this (somewhat incorrectly), and adds "Holstein," in Prussia, apparently on his own authority. "Mâle inconnu."

Dr. Chapman has just sent me three more females with a single male, bred during August, 1912, at Col d'Iseran, in the



Graian Alps of Savoie, France, about fifteen miles north of Mt. Cenis, at 9000 ft., from pupæ of *Gnophus cælibaria*. The females are conspecific with the above, and the male is quite certainly its alternate sex, which has not hitherto been associated with it, though described by Holmgren in 1878 (Verh. z.-b. Ges. Wien, xxviii. p. 173, in his "Enumeratio Ichneumonidum exhibens species in alpinis Tirolia captas") in the male sex only under the name *Ichneumon barbifrons*, on account of the elongate capital pilosity found only in this sex, or to a much less degree in the female. His description is excellent, but he indicates no more exact locality, and no one has since recognized the species.

Monk Soham, Suffolk: October 15th, 1913.

## NOTES AND OBSERVATIONS.

UNUSUAL PAIRING OF MOTHS.—I was interested to see in the 'Entomologist' for November, 1913 (vol. xlv. p. 314), Mr. A. E. Hodge's note upon the pairing of a male *N. xanthographa* with a female *C. graminis*. Some years ago, whilst living in London, I had a male *E. versicolor* pair with a female *Prodromaria*. Many ova were laid, but these proved infertile and soon shrivelled up.—G. BERTRAM KERSHAW; West Wickham, Kent, November 3rd, 1913.

NOTE ILLUSTRATING MILDNESS OF THE PAST SEASON.—I captured a very worn male of *Pernoptilota fluviata* on my study window on September 30th, a perfectly fresh male on October 25th, and a third male in good condition on November 26th. This seems to indicate the maturing of two broods after the end of September. *Vanessa urticae* appeared in the garden on November 24th. A bat was hawking round street lamps on November 23th.—E. N. C. STOWELL; Laleham, Bexhill-on-Sea, December 12th, 1913.

NOTE ON REARING DASYPOLIA TEMPLI.—In July of last year I collected a number of larvæ of *D. templi* in the neighbourhood of Kinloch Rannoch, but from over thirty larvæ I only bred two insects, all the rest being stung. This year, in July, I collected more larvæ in Cornwall, and practically all these attained the imago stage. The Scotch insects emerged on September 20th and 26th, while the Cornish insects did not begin to appear until October 28th, and continued till November 12th. This may have been caused by the difference in the two seasons, but I think it more probable the Scotch winter being earlier, insects from there habitually emerge at an earlier date. The larvæ are easy to find in infected plants of *Heracleum sphondylium*, and very easy to rear, in my experience. All that I did was to dig up with a trowel infected plants and replant them in a large tin or rhubarb pot, together with a few uninfected plants—and this I covered with a perforated zinc cylinder with a muslin top. The larvæ required no attention, and when full

fed left the plants and pupated in the surrounding earth, without any cocoon.—PERCY C. REID; Feering Bury, Kelvedon.

DRAGONFLIES BRED IN 1913.—I have bred this year *Gomphus vulgatissimus* (one), *Æschna grandis*, *Cordulia aenea*, *Libellula quadrimaculata*, *Sympetrum striolatum*, *Pyrrhosoma nymphula*, *Ischnura elegans*, *Erythromma najas*, and *Calopteryx virgo*. The nymph of *Gomphus vulgatissimus* was obtained in the New Forest in May. It is the first time I have taken one of this species, though I have for some years collected nymphs (and bred, too) in the same place in the forest, on one day at any rate, in early summer. I got no *Cordulegaster annulatus* this year, though they have generally turned up there, or, more accurately, have been turred up. A few hours on the Ouse, near St. Ives, in early June produced many *Ischnura elegans* and one nymph—an Anisopterid—which I have not yet been able to identify. It is growing fast, living mainly on small snails; but it is now taking to worms, which it refused for a long time.—HAROLD HODGE; 9, Highbury Place, London, N.

PLEBEIUS (LYCÆNA) MEDON (ASTRACHE) IN DOVEDALE.—Referring to the note of Mr. St. John (vol. xvi. p. 314), I was in Dovedale in July, 1908, and found this species quite common and I secured, as did Mr. St. John, quite a good series of thoroughly typical specimens. Insects generally were decidedly scarce, though I took one specially prettily marked blue female of *Polyommatus icarus*. *Nudaria mundana* was not uncommon on the walls of the outbuildings of some of the farmyards, whilst *Boarmia bistortata lariciaria*, Dbld. occurred in the dale. I also took one or two pretty *Cerostoma sequella*—and, apart from lepidoptera, *Sirex gigas* females were seen several times, though I only took a single specimen.—G. T. BETHUNE-BAKER.

A DRAGONFLY AT SEA.—On September 6th, somewhere in mid-sea, between Kevel and Helsingfors, I saw the insect flying about over the deck. It subsequently settled on a chair, where it was caught by a fellow-passenger, who gave it to me. The presence of this dragonfly seemed curious, since there was no land within a good many miles, neither had we touched land since leaving England.—JOHN B. HICKS; Stoneleigh, Elmfield Road, Bromley, Kent, November 8th, 1913.

WASPS ACTIVE IN DECEMBER.—On December 5th I was much interested watching wasps, apparently workers, going in and out of a nest in the ground. This must be unusual.—E. C. STOWELL; Laleham, Bexhill-on-Sea, December 12th, 1913.

POLIA FLAVICINCTA IN GLAMORGANSHIRE.—I took this moth at sugar on October 2nd last in my garden. I can find no record of its being taken in this county before.—E. U. DAVID; Yscallog, Llandaff, November 24th, 1913.

NOLA ALBULA IN HANTS.—I have much pleasure in reporting the capture of *Nola albula* whilst collecting in Hampshire (about July 18th and 19th). My friend, Mr. Danby, has two specimens, and I

have one. Others were taken, but unfortunately got damaged in travelling. Am I right in believing this to be a new record for the county?—ARTHUR BUSS; 43, Gleneldon Road, Streatham, S. W.

ACRONYCTA MENYANTHIDIS EMERGING IN NOVEMBER.—On looking in my pupa-cage on November 3rd, I was surprised to find that a female specimen of *Acronycta menyanthidis* had emerged from pupæ sent me from "Barnard Castle," all collected this year. They were kept in a glass-top bottle in a room with no fire, temperature about 55° to 60°. I thought it would be interesting to record this, because I can find no record of so late an emergence.—H. L. DOLTON; 27, Brunswick Street, Reading, November 17th, 1913.

EARIAS CHLORANA IN GLOUCESTERSHIRE.—In August, 1912, the Rev. G. M. Smith found about a dozen larvæ of this species feeding on the osiers growing on the Severn bank near Gloucester. One or two imagos emerged in the following September, but the rest hibernated as pupæ and came out at intervals during May, June, and July of this present year. It is curious that this species has not apparently been observed in this county hitherto.—C. GRANVILLE CLUTTERBUCK, F.E.S.; 23, Heathville Road, Gloucester, November 16th, 1913.

HYPOTION (CHÆROCAMPA) CELERIO IN HANTS.—A specimen of *C. celerio* was caught by a cat in a house in this parish last September. The locality is less than a mile from the sea, between Lymington and Christchurch.—(Rev.) J. E. KELSALL; Milton Rectory, New Milton, November 22nd, 1913.

DAPHNIS (CHÆROCAMPA) NERII.—One of these very rare visitors occurred here this season, and was captured on September 16th. The moth was seen on the wing at about 4.15 p.m. by two small village boys, who eventually succeeded in their endeavours, with the aid of their caps, &c. The following day it was brought to my house (partly for identification), being a pitiable sight but still alive; it is, nevertheless, sufficient to serve as a record. My friend Mr. Brown of Ainsdale kindly lent me the moth for exhibition at the November meeting of the Lancashire and Cheshire Entomological Society.—W. A. TYERMAN; Derby Villa, Ainsdale, Southport, November 19th, 1913.

CATOCALA FRAXINI IN LANCS.—A specimen of *Catocala fraxini* (Clifton Nonpareil) was caught at Grange-over-Sands, Lanes, September 7th, 1913, in the grounds of Yewbarrow Hall, the residence of Evan A. Leigh, Esq.—J. DAVIS WARD; Limehurst, Grange-over-Sands.

COLIAS EDUSA REARED IN KENT.—On May 23rd, 1913, my son brought to me a female *Colias edusa* he had caught with his cap in a waste field not fifty yards away from our house. I succeeded in keeping it alive for three weeks. During that time it kindly obliged with one hundred and fifty ova; these I placed singly in airtight tins with a glass top, my intention being to try for a second brood, but the larvæ grew so slowly that I had to abandon the idea. The first imago emerged on August 15th and the last on September 9th. I



might add the larvæ were kept indoors and out of the sun, so probably this had something to do with slow growth. Altogether I bred a nice long series, but with little or no variation.—A. J. EXETER; Watling Street, Dartford, Kent, October 17th, 1913.

*COLIAS EDUSA* IN MIDDLESEX.—In previous *Edusa* years I have usually observed one or two examples here in August or September. But this season the "clouded yellow" has not put in an appearance. However, my cousin, Dr. R. P. Cox, of Ealing, informs me that in August several visited his garden; and he reports it also to have been not uncommon at Shipley, in Sussex, and at Torquay.—H. ROWLAND-BROWN; Harrow Weald, December 15th, 1913.

NOTES ON *COLIAS ELUSA*, &c., IN ESSEX.—I first noticed *C. edusa* here on August 20th. The next day I visited a small field of lucerne about ten minutes' walk from my house. On the way a bright looking female *edusa* passed me in the road, but my net was in my pocket. On reaching the field not a specimen of *edusa* was to be seen, but after waiting for nearly an hour, a male flew by and settled on one of the lucerne flowers and was captured, and in the course of half an hour I saw three more, and caught two of them—both males. There was a fair amount of bloom on the lucerne, and it was a warm bright afternoon, but butterflies were very scarce. I only noticed single examples of *Pyrameis atalanta*, *P. cardui*, *Vanessa io*, a few fresh *V. urticae*, and one or two each of *Cæonympha pamphilus*, *Lycæna icarus*, *Chrysophanus phlaeus*, and *Adopæa lineola*. *Pararge megera* was the most numerous, and there were a few *Pieris rapæ* and *P. napi* which were noticeable on account of their small size. Two of the *napi* I caught are, I think, the smallest I ever saw, measuring barely  $1\frac{1}{4}$  in. across the wings. A few *Plusia gamma* were buzzing about amongst the flowers, and one or two *Nomophila noctuella* (*S. hybridalis*) were disturbed from the herbage. On August 25th I saw a large female *edusa* flying along the high road. The next day I went to Walton-on-the-Naze, as I thought that might be a more likely neighbourhood, and I particularly wanted to get a female *C. edusa* for eggs. On arriving at Walton I walked out to the eastward of the town, by the footpath on the top of the cliffs, and when about half way to the Naze saw a bright-looking female flying about willow herb some distance below me, but she would not come within reach, nor could I get down to her. Further on I was pleased to see, on my left, a large clover field one mass of bloom—indeed, I smelt it long before I saw it. Here I thought I should surely find all the *edusa* in the neighbourhood congregated, but was disappointed, for when I got into the field, nothing was to be seen but a few *rapæ*, *napi*, &c. I stopped there for more than an hour, sat under a hedge, eat my lunch, and smoked a pipe, but no *edusa* would come. It was gloriously hot and bright—just the day for them. After this I walked a little further along the coast, beyond the Naze, and then turned back, as it was time to go to the station for my train home—and I had hardly done so when a male *edusa* came dashing along and was secured. On the 28th I saw another male at Dovercourt, and this was the last.



On August 27th I received five living females from my friend Commander Gwatkin-Williams, R.N., who had taken them the day before at Broadstairs, where *C. edusa* appears to have been rather plentiful. They were placed under muslin hoods over growing plants of white clover and birdsfoot trefoil in flower-pots, and put in a warm place in the garden. Next day I saw a good many eggs had been laid, and by the time the last female died, two or three hundred ova had been deposited. The eggs were pearly-white at first, but soon changed to orange, and by September 2nd some had become lead colour, and larvæ began to hatch out the following day. The young larvæ were dingy-olive, with shining black heads, and their first act was to devour their egg-shells, then, after they had rested a bit, they wandered about, and finally settled either in the middle or at one of the corners of a leaf, and began to nibble at the upper cuticle, making small blotches. They laid up for their first change on September 10th, and some had got through by the 12th, and were then dull green, with minute black dots and short pale hairs. I will not give any further account of their progress, as that has been done so many times by other writers. The pots were kept in a window facing south, and everything went well with the larvæ until the temperature began to fall towards the beginning of October, when many of the smaller ones began to sicken and die off. Some of the larger ones by this time were nearly full grown. On October 9th I noticed one had attached itself to the side of the muslin hood, and the next day became a pupa. By the 17th there were a dozen pupæ, but scores of larvæ had died, and those remaining would not eat, and eventually they all perished. None of them appeared to make any attempt to hibernate. By this time it was getting very much colder, and I had started a fire in my sitting-room. All the pupæ were now pinned to a sheet of cork, and this was placed under a glass cylinder, with a French Clocke over it, on a table close to the window, where they got the full benefit of the sun. On the 26th the first pupa began to change colour, and by the 31st the wing cases were bright orange, and the black margins of the wings plainly visible, and on November 2nd, about noon, I observed the butterfly trying to escape from its chrysalis, and it had evidently been trying for a little time before I noticed it, as its wings were hanging down partially developed, so I lifted glass and cylinder and, with a pair of forceps, managed to free it, but it was then so feeble it could not grasp anything, and I had to hold it by its front legs, after which I managed to tie a piece of silk round them, then passed the silk over a pin in a piece of cork and left it, and eventually the wings grew to their full size, though one of them was slightly puckered, but I managed to smooth this out when I set it. Other pupæ were changing colour at this time, but most of the butterflies seemed to be unable to emerge, and I only bred five altogether, viz: November 2nd, one male; November 6th, one female; November 9th, two males; November 11th, one male. Unfortunately I have no greenhouse, if I had I should no doubt have bred a larger number of the butterflies.—GERVASE F. MATHEW; Lee House, Dovercourt, November 17th, 1913.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, November 5th, 1913.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Mr. A. P. Semenoff Tian-Shanski was elected an Honorary Fellow in the place of the late Prof. O. M. Reuter.—The following gentlemen were elected Fellows of the Society:—Messrs. Hugh Warren Bedford, Church Felles, Horley; Harold S. Cheavin, F.R.M.S., F.N.P.S., Clematis House, Somerset Road, Huddersfield; Charles Alban William Duffield, Stowting Rectory, Hythe, and Wye College, Kent; W. Egmont Kirby, M.D., Hilden, 46, Sutton Court Road, Chiswick, W.; Louis Meaden, Melbourne, Dyke Road, Preston, Brighton; F. V. Bruce Miller, Livingston, N. Rhodesia; Alexander David Peacock, 137, Wingrove Gardens, and Armstrong College, Newcastle-on-Tyne; H. Ananthaswamy Rao, Curator of the Government Museum, Bangalore, India; Percival Nathan Whitley, New College, Oxford, and Brankwood, Halifax.—The question of the change of title of the Society was opened for discussion, but the preponderance of feeling appeared to be somewhat against any change.—The President brought before the meeting the necessity of forming a fund for the care of that portion of Wicken Fen left by the late Mr. G. H. Verrall to the National Trust, and at his request Mr. Rowland-Brown expressed his readiness to act as Treasurer for any subscriptions given by Fellows of the Society.—Dr. G. B. Longstaff exhibited a series of seventeen *Thais rumina*, L. (including a female of the var. *canteneri*, Feld.), taken in March, 1913, at Ronda, and called attention to the characters suggestive of a distasteful butterfly.—Mr. W. J. Lucas, three species of *Panorpa*, including a female of the scarce scorpion-fly, *Panorpa cognata*.—Mr. H. Lupton, a specimen of *Thalpocharis ostrina*, taken in the middle of June, 1913, about four miles from Ilfracombe. Also two specimens of *Dianthæcia luteago* var. *jicklini*, taken in the middle of the same month on the coast of N. Devon.—Dr. G. D. H. Carpenter read notes in connection with his exhibit of *Epitoxa albicincta*. He also exhibited a case of miscellaneous insects and communicated notes upon them.—Mr. Donisthorpe exhibited males, winged females, and a deâlated female and workers of the very rare ant, *Solenopsis fugax*, Latr., taken at Blackgang, Isle of Wight, on August 26th, 1913.—Mr. E. E. Green, an aberrant example of *Pyrameis (Vanessa) indica*, Herbst, from Ceylon.—Comm. J. J. Walker, a female specimen of the gigantic Neuropteran, *Corydalus orientalis*, McLach., taken by a native collector at Chuchow.—Mr. L. W. Newman, the following Heterocera:—(1) *Calymnia (Cosmia) trapezina*. A melanic female—a worn specimen taken at sugar in Bexley Woods. (2) *Zonosoma (Ephyra) annulata* and *pendularia*; a long and very varied series of both species, showing extreme light, dark, and intermediate forms and one very pink *Z. pendularia*. (3) A series of hybrid *Z. pendularia*, female, and *annulata*, male; specimens showing the markings of *pendularia* most pronounced and the coloration of *annulata* prominent.—The following papers were read:—"New or little-known Heterocera from Madagascar," by Sir G. H. Kenrick, Bart., F.E.S. "The Culicidæ of Australia," by Frank H. Taylor, F.E.S. "Descriptions of New Species of Staphylinidæ

from India." by Malcolm Cameron, M.B., R.N., F.E.S. "*Pseudacraea eurytus hobleyi*, Neave, and its models on Bugalla Island, Lake Victoria, with other members of the same combination," by G. D. H. Carpenter, B.A., M.D., F.E.S. "*Pseudacraea boisduvali*, Doubl., and its models with special reference to Bugalla Island," by the same. "The inheritance of small variations in the pattern of *Papilio dardanus*, Brown," by the same.

Wednesday, November 19th, 1913.—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—It was announced that the Council had decided to make an annual grant of two guineas towards the maintenance of Wicken Fen.—The following gentlemen were elected Fellows of the Society:—Messrs. B. G. Adams, 15, Fernshaw Road, Chelsea; Barnard Ormiston Dickinson, B.A., 57, Castelnau, Barnes, S.W.; Alfred Oliver Rowden, 3, Archibald Road, Exeter; Oscar Whittaker, Ormidale, Ashlands, Ashton-upon-Mersey, Cheshire.—The following Fellows were nominated by the Council as Officers and Council for next year:—President, Mr. G. T. Bethune-Baker, F.L.S., F.Z.S.; Treasurer, Mr. A. H. Jones; Secretaries, Commander J. J. Walker, M.A., R.N., F.L.S., and Rev. G. Wheeler, M.A., F.Z.S.; Librarian, Mr. G. C. Champion, A.L.S., F.Z.S.; other Members of the Council: Messrs. E. A. Butler, B.A., B.Sc.; J. E. Collin; S. Edwards; Dr. H. Eltringham, M.A., D.Sc., F.L.S.; C. J. Gahan, M.A.; A. E. Gibbs, F.L.S., F.Z.S.; E. E. Green; G. Meade-Waldo, M.A.; Dr. G. W. Nicholson, M.A., M.D.; Hon. N. C. Rothschild, M.A., F.L.S., F.Z.S.; H. Rowland-Brown, M.A.; and C. J. Wainwright.—Mr. A. H. Jones exhibited specimens of both sexes of *Plebeius zephyrus* var. *hesperica*, taken by him in June last, at Albarracin in Spain; *P. zephyrus*, type, and var. *lycidas* were also exhibited for comparison. Also from Albarracin, *Melitæa desfontainii* var. *bœtiea*, Rbr., the Spanish form of *M. desfontainii*, Godt., (an Algerian butterfly); both sexes were exhibited.—Mr. E. E. Green, two Pierid butterflies, of distinct genera, taken in *coitû* at Aripu, Ceylon, viz., *Appias libythea*, Fab., male, and *Teracolus limbatus*, Butl., female.—Mr. W. J. Kaye, a large and very variable series of *Heliconius doris*, L.—Dr. Chapman, some Erebias, showing parallel variation in several species in different localities. He raised the question whether this was a case of mimicry, and a considerable discussion followed.—Dr. F. A. Dixey, a drawer containing specimens of the genus *Pieris*, with drawings of their scent-scales, and remarked upon them.—Mr. A. Bacot, slides showing the development of Plague bacilli in the alimentary canal of the flea, and the method of infection through the mouth, and read an important paper on the subject.—Dr. K. Jordan, some specimens of a lepidopterous larva discovered by the Rev. A. Miles Moss, F.E.S., who, when collecting near Pará, noticed a Saturniid caterpillar with black intersegmental bands and long branched spines, a species of *Automeris*, some of the black bands of which appeared to be swollen. To his amazement these swellings, when touched, quickly slid over the back of the caterpillar to the other side with the hurried motion of a Pyralid larva, and indeed turned out to be small lepidopterous larvæ as black and glossy as the bands of the *Automeris* caterpillar.—The following papers were read:—"Revision of the Mexican and Central American Malachiidæ



and Melyridæ, with descriptions of new genera and species," by George Charles Champion, F.Z.S. "Four new genera and species of Hymenoptera from Australia," and "Three new species of Australian Hymenoptera," by A. A. Girault, communicated by A. M. Lea, F.E.S., Government Entomologist, South Australia.—GEO. WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 9th, 1913.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Large additions to the Society's reference collection of British Lepidoptera from Mr. W. G. Dawson were announced.—Mr. Lucas read a paper: "The Shorthorned Acridians of the British Isles," and illustrated his remarks with lantern slides of all the species.—Mr. Ashdown exhibited Lepidoptera taken by him in Switzerland in June and July last.—Mr. Colthrup, a snail shell from which he had bred a Dipteron, presumably parasitic in the snail.—Mr. Andrews, a scarce Dipteron, the Syrphid *S. guttatus*, taken at Bexley in August.—Mr. Step, living examples of the ant-nest Isopod *Platyarthrus hoffmannseggii*, found in a nest of *Formica fusca*.—Mr. West (Ashtead), enlarged photographs of the same rare woodlouse.—Mr. Curwen, specimens of *Syntomis phegea* and its var. *pflumeri*, in which the white spots were reduced in size and number, from Pallanza and Iselle, together with specimens of the rare *Naclia ancilla*.—Mr. Newnan, picked series from a large number of bred *Melitæa aurinia*, from County Clare and Oban. The variation was extremely small, although the larvæ were samples of many broods.—Mr. Tonge, a series of *Coremia quadrifasciaria*, bred from a female taken at Albury, Surrey, showing but little variation.

October 23rd, 1913.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Prof. E. B. Poulton, F.R.S., gave an account of the Mimicry exhibited by the Nymphalines of North America, illustrating his remarks by specimens and lantern slides.—Mr. W. J. Kaye exhibited a collection of the Sphingidæ found in the Island of Trinidad. There were about forty species in all.—Mr. Sheldon, series of species taken by him near Albarracin, Central Spain, including *Plebeius zephyrus* var. *hesperica*, *Agriades thetis* ab. *rufolunulata*, *A. thesites*, and *Glaucoopsyche cyllarus*. Dr. Chapman was of opinion that *A. thesites* only occurred when sainfoin was indigenous.—Mr. L. W. Newman, Lepidoptera from County Clare, County Cork, and Killarney, including very light *Aplecta nebulosa*, very dark *Luperina cespitis*, *Aphantopus hyperanthus*, with greenish shade on the under side, *Egeria scolæformis*, bred *Dianthæcia capsophila*, *D. luteago* var. *barrettii*, &c. The weather was very bad from April to the end of September.—Mr. A. E. Tonge, a specimen of *Argynnis aglaia*, with a strongly marked blotch formed by the coalescence of several spots on the fore wings.

November 13th, 1913.—Mr. A. E. Tonge, F.E.S., President, in the chair.—Prof. W. Bateson, F.R.S., gave an address on the "Problem of Species which overlap Geographically," illustrating his remarks with numerous lantern slides.—Mr. Curwen exhibited specimens of *Parnassius apollo* from Eclépens and the Laquinthal, mostly very large examples, and including var. *pseudonomion* from Eclépens.—



Mr. Newman, long and variable series of *Zonosoma annulata* and *Z. pendularia*, with many dark aberrations; and also a series of the hybrid between these two species, showing well the characters of both.

November 27th, 1913.—The President in the chair.—The Annual Exhibition of Varieties, &c.—Mr. West (Greenwich), the Hon. Curator, fifteen cabinet drawers of the Society's reference collection, with which had been incorporated a portion of the Dawson collection.—Dr. Chapman, a nearly black *Argynnis aglaia* from Le Lauteret, July 13th, 1913, and specimens of *Agriades thersites*, *Polyommatus icarus*, and var. *icarinus*, with diagrams to show the different alignment of spots.—Mr. Edwards, a box of conspicuously coloured Heterocera from Burmah.—Mr. H. Moore, the rare *Papilio hecateus* from the Solomon Islands.—Mr. Schmassmann, a series of varieties in the male of *Ornithoptera hecuba*, and a pair of the gorgeous *O. alexandrae* from New Guinea.—The Rev. G. Wheeler, examples of melanic and xanthic aberrations, including *Argynnis niobe* ab. *pelopia*, *Melitæa phæbe* ab., *M. varia* ab., *M. cinxia* ab., and *Melanargia* ab. of the former, and *A. niobe* v. *eris*, *Callimorpha dominula* v. *persona*, &c., of the latter, and referred to many species in which yellow was produced in aberrational forms.—Mr. R. Adkin, a series of third brood *Celastrina argiolus*, and discussed the species as to its appearance during the present season. He also showed long series of *Agriades corydon*, including ab. *syngrapha*, ab. *semisyngrapha*, and many other fine aberrations and series from many localities.—Mr. Baumann, a series of *Boarmia repandata* from several localities, including var. *sodorensum* and var. *conversaria*, and specimens of the melanic form of *Acidalia virgularia*, which he was placing in the Society's collection.—Mr. Bright, a large number of striking aberrations of British Lepidoptera, including long series of under sides of *Agriades thetis* and *A. corydon*, a white aberration of *Argynnis paphia*, *Colias edusa*, with wings richly shot with purple, a curious *Saturnia pavonia* of female coloration with male antennæ, &c.—Mr. Grosvenor, his fine collection of *Cænonympha tiphon* and its local races.—Mr. Curwen, numerous Lycænidae taken by him in Italy and Switzerland, and many aberrations of *Melitæa didyma*.—Mr. Newman, a varied series of recently bred *Smerinthus ocellatus*; series of *Amorpha populi* from pale cream to almost black colour, with intermediate and rich pink forms; and a series of hybrid *ocellatus* males and *populi* females, two being of the rare female form.—Mr. A. Gibbs, a section of his collection of South American Nymphalids, including many of the brilliant species in the genus *Perisamia*.—Mr. W. G. Sheldon, long series of *Melitæa desfontainii*, taken by him at Albarracin this year, and a series of *M. aurinia* v. *iberica*, from near Barcelona, for comparison.—Mr. T. W. Hall, cabinet drawers of *Agriades corydon* and *A. thetis*, showing great aberration with very pronounced blue females, and some females curiously splashed with blue.—Mr. Main, frames containing series of photographs of the life-histories of *Cicindela campestris* (tiger-beetle), *Chrysopa flava* (lace-wing fly), *Phyllotoma aceris* (jumping sawfly), &c.—Mr. Tonge, a bred series of *Psilura monacha*, including the black form ab. *eremita*; a long series of *Tapinostola concolor*, &c.—Mr. W. J. Kaye, a case of twenty-three

pairs of the South American genera *Melinæa* and *Heliconius*, found flying together and assimilating to each other in colour.—Commander Gwatkin-Williams, aberrations of British Lepidoptera from Ireland, including *Epinephele jurtina*, with banded hind wings, females; several *Cidaria*, which possibly may be *C. concinnata*, *Xanthorhœ montanata*, with band obsolete, confluent *Anthrocera trifolii*, *Euchloë cardamines*, females with ochreous hind wings, &c.—Mr. Chas. Oldham, two collections of small chalk stones that he had collected within a small radius of the openings of two wasps' nests, and which the wasps had been unable to carry to a greater distance.—Mr. A. W. Buckstone, for Mr. Archer, a bleached form of *Angerona prunaria*, male, from Oxshott; an almost black *Lithosia helvola (deplana)* from Wimbledon; and an *Acidalia* which was supposed to be a very aberrant form of *A. subsericeata*.—Mr. H. Worsley-Wood, numerous forms of *Mellinia ocellaris*, including ab. *lineago*, ab. *intermedia*, with *M. gilvago* for comparison; yellow *Brephos parthenias* from Wimbledon, and lead-coloured males of *Agriades thetis* from Corfe.—Rev. J. Tarbat, black suffused forms of *Brenthis euphrosyne* ab. *nigro-sparsata* of *Abraxas grossulariata*, and a *Cidaria truncata* with a broad-banded fore wing.—Mr. Haynes, a series of hybrid *Selenia tetralunaria* males and *S. bilunaria* females, with a large preponderance of gynandromorphous specimens; melanic and ochreous varieties of *Ennomos quercinaria*, &c.—Mr. H. J. Turner, a series of *Erebia stygne* from the Continent to show the extreme local variation in the Alps and Pyrenees.—Messrs. Sharp & C. W. Colthrup, many *Colias edusa* from the south-eastern district, representative of the species in 1913.—H. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*October 20th, 1913.*—Meeting held at the Royal Institution, Colquitt Street, Liverpool.—The President, Mr. F. N. Pierce, F.E.S., in the chair.—Exhibitions were as follows:—Mr. W. Mansbridge brought a long-bred series of *Hadena glauca* from Burnley, some of which showed a strong melanic tendency; also from Burnley the melanic variation of *Ematurga atomaria*, *Hyria muricata*, purple form, and *Cenonympha typhon* var. *rothliebii* from Witherslack; *Nyssia zonaria* from the Crosby Sandhills, and the insects captured on the occasion of the Society's field meeting at Mold on June 7th, 1913, including *Lobophora viretata*, *Cnephasia musculana*, *Capua favillaceana*, *Argyrolepis hartmanniana*, and *Agriopsis aprilina* (larva).—Mr. R. Tait showed a long and variable series of the beautiful melanic form of *Boarmia repandata* from Penmaenmawr, also bred *Agrotis lucerneæ* from the same district; varieties of *Abraxas grossulariata*, including ab. *varleyata*, bred from various localities in 1913; *Aplecta nebulosa* var. *robsoni* and *Geometra papilionaria* from Delamere; *Hecatera serena* and *Calligenia miniata* from Sussex. Mr. Tait also gave an account of his collecting holiday in Sussex, from which it appeared that Lepidoptera had been as difficult to obtain in the South of England as in the North during the past summer.—Mr. Johnson exhibited a long and fine series of *C. typhon*, including some very dark forms, from Witherslack; also *Acidalia fumata*, *Nissoniades tages*, and *Lycæna astrarche* from the same place.—Dr. P. F. Tinne, various

species of autumn lepidoptera from the North of Ireland, including a nicely varied series of *Cidaria truncata*, several being the var. *centumnotata*. All the members present reported a very poor season from a collector's point of view.—WM. MANSBRIDGE, *Hon. Sec.*

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## RECENT LITERATURE.

*Common British Moths.* By A. M. STEWART. London: Adam & Charles Black. 1913. Pp. viii, 1-88. Sixteen plates.

THIS little book is a worthy companion-volume to the 'British Butterflies' by the same author, already noticed in the 'Entomologist' for 1912, p. 212. The eight coloured plates are really of most excellent workmanship, one is inclined to think some of the best ever produced, certainly in entomological literature. They are splendidly clear, and marvellously accurate in colour. They contain figures of some two hundred species, all those mentioned in the text in fact, and though only three-fourths natural size it should be quite impossible to identify wrongly any of the species figured. The black-and-white plates of preserved larvæ, &c., have been well chosen, the text is obviously the work of a practical entomologist, and the species described form a very excellent representative collection of the commoner British moths, amongst them, one is pleased to note, some of the "Micros" being given a place. Errors of any kind seem exceedingly few, although it is difficult to understand how the specimen of *Boarmia repandata* var. *conversaria*, figured on Plate 15, came to be labelled "*B. gemmaria* var. *perfumaria*," probably by accident. The book is absolutely ideal for the young beginner.

N. D. R.

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*Transactions of the City of London Entomological and Natural History Society for the year 1911.* Pp. 32. Published by the Society, The London Institution, Finsbury Circus, 1912.

WE have received a copy of the above Society's 'Transactions' for 1911. Apart from the notes in the President's address upon the season's collecting and upon the scarcity of some insects formerly so common in their haunts, there is a short but quite interesting paper by Mr. Tautz upon the species of the genus *Cosmia* (*Calymnia*). This includes a record of *C. pyralina* from Middlesex (Pinner), a species which the author states had not been previously recorded, so far as he knew, from that county, but here he is in error, as the species is pretty generally known to inhabit Middlesex, and was recorded from Mill Hill over thirty years ago.

N. D. R.

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[No. 609

## A NEW SPECIES OF *METANCEA* FROM FRANCE.

BY KENNETH J. MORTON, F.E.S.

IN examining a small lot of Trichoptera taken by Dr. Chapman last summer in the Alps of Dauphiné, forwarded by Mr. Lucas, I found four insects, which at first sight I supposed to be *Metancea flavipennis*, Pict. On confronting these, however, with McLachlan's figures, I was surprised to find that the details did not agree satisfactorily, and on looking over the material in my collection it was manifest that there were two species, and these rather distinct ones, mixed together, examples from Murgtal (Ris), Silvaplana (Morton), and Carinthia (Klapálek), pertaining to the species described and figured by McLachlan, while others from the Val Bedretto (Ris) were evidently the same as Dr. Chapman's. I asked Dr. Ris to go over his material, and he confirms my view of the matter. The only explanation of the oversight that can be offered is the identical general appearance of the two species, and even with regard to the profile view of the genitalia the similarity is rather remarkable. I propose to describe this hitherto overlooked species as—

### *Metancea chapmani*, n. sp.

Very similar in appearance to *H. flavipennis*, Pict. Head, thorax, palpi, legs, and under side of body testaceous, hairs golden; abdomen above darker. Basal joint of antennæ and between the posterior ocelli slightly fuscous. Spines of legs black.

Anterior wings narrow and elongate, pale yellowish, shining neurulation concolorous, pubescence of membrane dense, golden. Discoidal cell about the same length as its footstalk. Posterior wings whitish, subhyaline with pale veins; first apical cell variable, but narrower at the base than second; second broader, moderately oblique at the base in the direction opposite to the first; third longer than first and second, almost acute at the base; upper branch of cubitus furcating about, or a little beyond the level of the beginning of the discoidal cell.

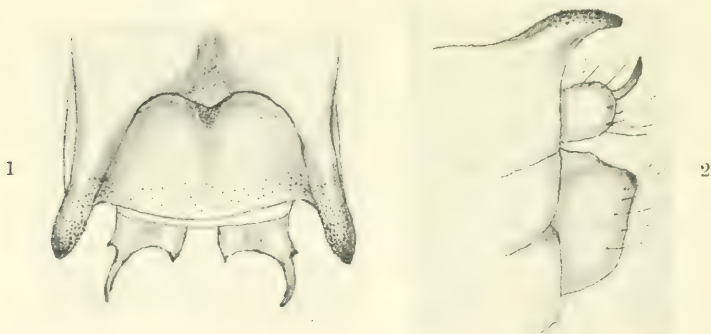
In the male the apex of the abdomen above is rather deeply concave, the posterior margin covered with scattered black tubercles, the side produced into rather long finger-shaped processes whose tips



are very slightly curved downwards, these processes also tuberculate, more densely so towards the apex which thereby becomes black. Superior appendages pale yellow with rounded outline when seen from the side, concave internally. Intermediate appendages viewed from behind, separate, each arising from a narrow stem and spreading out in broad triangular form with three distal projections, the two side ones small, the other long, horn-like, slightly inturned with a small tooth before the apex. Inferior appendages large; from beneath they are close together at the base, diverging slightly, concave internally, rounded at the apex, which is very slightly inturned and clothed internally with short spines and spinous hairs.

I am unable satisfactorily to describe the female. Differences probably exist in the genitalia as compared with *H. flavipennis*, and these could very likely be defined from Canada-balsam preparations.

Expanse of wings, male, 19–20 mm.; female, 21 mm.



*Metanæa chapmani*.

1. Apex of abdomen viewed from above. 2. Apex of abdomen viewed from side.

Three males, one female, Lauteret, Alps of Dauphiné (Chapman, July 22nd, August 5th). Also occurs in Val Bedretto (Ris, September 6th, 1896; July 20th, 1906): Splügen (Ris, July 16th, 1897), uncertain whether from the Swiss or the Italian side, probably the latter; Madonna di San Martino (July 29th and August 1st, 1889, Nägeli in Ris coll.).

Differs from *H. flavipennis*, especially in the direction of the blackened processes of the last dorsal segment. These in *H. flavipennis* are turned to the side almost at right angles to the long axis of the abdomen, whereas in *H. chapmani* they are nearly parallel, only very slightly out-turned.

McLachlan gives the following localities for *H. flavipennis*: Dissentis, Grisons (July 25th, Stainton), Bergün (Zeller), Leuk, Valais (October 2nd, Frey Gessner) Hospice St. Bernard; Prätigau and Pontresina according to Meyer-Dür; Meyringen (McLachlan, August 16th), Champéry, Valais (Eaton, August 20th), Samoëns, Savoy (Eaton, September 5th); Carinthia (Sep-

tember, Zeller). Hagen stated that he had it from the Harz, Bavarian Alps, and Styria (?). Ulmer adds Hessen. Supposing it to be the true *flavipennis* of Pictet, it should occur in the Val d'Illiers, Valais. This list may require revision, as some of these localities may refer to *H. chapmani*. I found *H. flavipennis* commonly at Silvaplana (July 18th to 25th, 1904); Ris has taken it in the Murgtal (July 27th, 1888), at Cierfs in the Münstertal (July 14th, 29th, 1909); and Klapálek in Carinthia (July 31st, 1899).

## A NEW SPECIES OF *CHIROTIRIPS* (THYSANOPTERA) FROM SOUTH AMERICA.

By C. B. WILLIAMS, B.A., F.E.S.

At the beginning of this year I received a small collection of miscellaneous insects from Mr. W. O. Backhouse, taken near Buenos Ayres, in the Argentine Republic, South America. Four genera of Thysanoptera were represented—*Chirothrips*, *Frankliniella*, *Physothrips*, and *Thrips*; the *Chirothrips*, which is a distinct species, is described below; notes on the others are reserved for the present, in the hope of getting further material to elucidate some doubtful points.

### Gen. CHIROTIRIPS.

Haliday, Ent. Mag. 1836, iii. p. 444; emend. Uzel, Monog. d. Thysanopt. 1895, p. 79; emend. Hinds, Proc. U.S. Nat. Mus. 1902, xxvi. p. 133.

#### *Chirothrips frontalis*, sp. nov.

Female (macropterous).

*Measurements*.—Head, length 0.15 mm., width (behind the eyes) 0.122 mm.; prothorax, length 0.22 mm., greatest width 0.26 mm.; pterothorax, length 0.32 mm., width 0.30 mm.; abdomen width 0.35 mm.; wing, length (from basal lobe) 0.80 mm., width (about halfway along) 0.045 mm.

Antennæ:—segment	1	2	3	4	5	6	7	8
length ( $\mu$ )	14	36	38	34	34	42	12	16
width ( $\mu$ )	36	40	24	24	21	20	7	5

Total length, about 1.4 mm., antennæ 0.24 mm.

*Colour* uniform dark grey brown, fore tibiae and all tarsi a little paler, the third segment of the antennæ distinctly lighter.

*Head* (Fig. 1.) longer than wide, produced beyond the eyes into a long prominence more than half as long as the remaining portion of the head. The sides of this at first diverge slightly and then converge rapidly to a rounded point; on the converging portion the antennæ are situated. There are no long hairs on the head but several small ones which vary slightly in position and may not be quite symmetrical. In general they conform to the arrangement shown in the

figure. *Eyes* dark and relatively far back. *Ocelli* distinct, the posterior ones behind the level of the back of the eyes. *Crescents* red-brown, distinct (in mounted specimens). *Mouth cone* rounded,



*Chirothrips frontalis*, sp. nov.  
Head and prothorax.

reaching about two-fifths across the prosternum. *Maxillary palps* three segmented, the basal segment shortest, the apical longest; four or five sensory hairs at the tip. *Labial palps* two segmented, the basal segment very short and indistinct, not much more than a ridge on the labium. *Antennæ* about two-thirds longer than the head; the first segment short and broad, the second much longer and narrower except at the apex where it is produced outwards into a blunt prominence, the third with a distinct pedicel, the fourth and fifth equally long, the sixth the longest, the eighth longer than the seventh. Colour: first and second dark, third clear, fourth to eighth darker but not so dark as the first two. An unforked sense-cone on the third and fourth segments.

*Prothorax* long, as wide as the head in front but much widened posteriorly, the whole surface of the pronotum finely striated and with a number of minute hairs scattered unsymmetrically over its surface. No long spines at the front angles, two at each hind angle and about six smaller hairs on each side along the hind margin. *Pterothorax* slightly wider than the prothorax in front, gradually narrowing behind. *Legs* normal for the genus, fore femora thickened and produced outwards at the base, tibiæ also thickened. All tarsi (except for a small dark spot at the base of the second segment) and fore tibiæ lighter than the rest of the legs. *Fore wings* pale brown, clearer at the base. About twenty (eighteen to twenty-one) spines on the costal vein, the distal ones finer and longer than the proximal; five or six spines at the base of the fore vein and two on its apical half; four, five, or six on the hind vein. The veins are usually very indistinct except near the base of the wings; this varies in different specimens. Hind wings clear, vein indistinguishable.

*Abdomen* normal, hairs on the ninth and tenth segments pale and weak. The ninth segment short, about half as long as the tenth.

Described from eleven macropterous females taken near Buenos Ayres, Argentine, South America, in January, 1913, by W. O. Backhouse, probably from a plant (Compositæ) locally known as "cepocaballo."

*Type* in the Hope Department, Oxford University Museum.

This species may be easily separated from all others of this genus by the great prolongation of the head beyond the eyes, and also from *hamatus*, *Trybom*, *obesus*, *Hinds*, *crassus*, *Hinds*,

and *mexicana*, Crawford, by having two spines at the hind angle of the prothorax, and from both *manicatus*, Bagnall, and *similis*, Bagnall (if these two are really distinct and not forms of the same variable species), by the more slender antennæ and relatively longer prothorax.

The John Innes Horticultural Institution,  
Merton, Surrey: January, 1914.

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## A NEW SPECIES OF *EURYTOMA* FROM QUEENSLAND, WHICH LIVES IN THE STEMS OF EUCALYPTUS.

By A. A. GIRAULT.

THE following species seems phytophagous, since I found it inhabiting short grooves or channels under the bark of young Eucalyptus trees, somewhat after the manner of Scolytidæ. Where occurring, the stems of the trees were somewhat swollen. When one thinks of it, this species does not seem to differ greatly in habit from the other members of its tribe, which seem to live on galls rather than upon gall-makers. Has the parasitic habit of the Eurytomini been proved? The genus *Bruchophagus* would incline one to doubt.

### Genus *EURYTOMA*, Illiger.

#### *Eurytoma picus*, n. sp.

Black, the legs, tegulæ and scape rich reddish brown, the hind coxæ black, the wings hyaline; flagellum brownish yellow, knees and tips of tibiæ yellow. Propodeum with a rather broad median groove. Venation pale; postmarginal and stigmal veins subequal. Scape obclavate; pedicel a little shorter than funicle 1, which is longest of the funicles, much longer than wide, about twice the length of funicle 5, which is somewhat wider than long, funicle 4 a little longer than wide, funicle 2 subequal to the pedicel. Club with three distinct joints, the antennæ 11-jointed. Mandibles tridentate. Hind tibiæ with two spurs. Pronotum with a more or less distinct, obtuse median carina. Punctuation not quite as dense as usual, the cephalic part of scutum densely, transversely lineolated.

*Male*.—Not known.

Described from two females taken from short grooves under the bark of young eucalypt trees in the forest, October 16th, 1913.

*Habitat*.—Nelson (Cairns), Queensland.

*Type*.—One of the above specimens on a tag, the head and a hind leg on a slide. In the Queensland Museum, Brisbane.

Magnification  $\frac{2}{3}$ -inch objective, 1-inch optic, Bausch and Lomb.



## NEW CENTRAL AMERICAN SYNTOMIDÆ.

BY A. E. GIBBS, F.L.S.

Among the Lepidoptera which I have recently received from British Honduras are two Syntomid moths which appear to be new to science. They were both captured at a small seaport called Punta Gorda in the south of the colony, not far from the frontier of Guatemala. I append descriptions.

*Phænicoprocta biformata*, n. sp.

Head black; frons blue; palpi orange below; antennæ white at tips; tegulæ orange with blue spots at base; patigia and thorax orange; coxæ orange-red; abdomen, first segment blue with paired red stripes, remainder brownish black with dorsal and lateral metallic-green stripes and bluish-green terminal segment; fore wings hyaline, veins broadly black, oval discoidal spot from costa to lower angle of cell, margins broadly black, widening at apex and on outer margin; hind wings hyaline, with dark borders, widening at apex and tornus.

Var. 1. Fore wings scaled, brown-black.

Expanse, 30 mm.

*Habitat*.—Punta Gorda, British Honduras, July, 1913. Types in British Museum; co-types of var. 1 in Mus. Gibbs.

*Napata cortes*, n. sp.

Black; tegulæ and patigia with paired blue-white spots; fore coxæ white; tibiæ reddish; first joints of tarsi white; metathorax with blue-green spot; first segment of abdomen black with a few blue scales and blue-green lateral spots; medial segments blue-green dorsally, with darker transverse bands; large white ventral patch on basal segments; remainder of abdomen ventrally and the terminal segments dorsally red; fore wing with bluish spot at base of costa; small hyaline spot extending across cell near base, and a larger one below it, another in cell near upper angle; a transverse series of four spots beyond cell, one above vein 6 and a smaller one below it, a minute spot above vein 4 and a larger one below it extending almost to vein 3; hind wing with hyaline patch at base; spot near end of cell and extending almost across it; below, fore wing with bluish costal streak, hind wing with blue basal streak above hyaline patch, costa narrowly and apex and outer margin broadly blue.

Expanse, 41 mm.

*Habitat*.—Punta Gorda, British Honduras, June, 1913.

*Napata cortes* has a general resemblance to *N. broadwayi*, Schaus., a Trinidad species, but it may be readily distinguished by the large hyaline patch at the base of the hind wing and the red terminal segments of the abdomen.

## A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 14.)

(v) *Basses-Alpes.* (a) *Allos.*

As in the case of a previous paper of the series, some qualification of title is necessary. Donzel\* discovered Allos in 1831. It has received several recent visits from English collectors, myself included, and I have given a short account of a week spent here in August, 1908 ('Entomologist, vol. xli. p. 268). However, as I was in this part of the Basses-Alpes at an earlier date than on the occasion of my last visit, or that of the late Mr. J. W. Tutt ('Entomologist's Record,' vol. xix. pp. 197-199), I trust my experiences may be useful to those who wish to explore the upper valley of the Verdon during the summer months. Allos remains primitive. The motor services, the endless procession of touring cars have left it unperturbed; and the little Hôtel du Midi, where Mdlle. Pascal works so hard for the comfort of her pensionnaires, is as archaic and roughly comfortable as ever.

After a rather disappointing entomological week at Digne—for the universal drought in the lower lands of Provence had burnt up all the green herb—I took train for Thorame-Haute by the familiar narrow-gauge line. Here the alpine motors of the Sud Company pick up, and they are almost as cheap as the former rusty diligence. Between St. André and the starting-point there are doubtless many fine butterfly corners as suggested by glimpses caught from the windows of the never-express train. Such a one there is near the station before Thorame, and there I bade farewell to *Papilio alexanor*—so unaccountably and unusually rare in 1913 in its native haunts at Digne. The drive is pleasant enough by Beauvezer and Colmars, with its narrow medieval streets, through which the motor steers, scraping the stucco from the walls of the overhanging houses—a veritable threading of the needle's eye. The climb scarcely begins before Colmars, from the gate of which town it is practically all uphill, and as dusty a road as ever provoked the thirst of man and beast. Still, there are several good stretches of collecting ground by the river *en route*, as I found when, on the hottest day of the year, I descended in quest of *Erebia scipio* at points indicated by Mr. Powell ('Entomologist,' vol. xli. p. 298).

I left Digne at eight o'clock, and reached my destination

\* 'Notice Entomologique sur les Environs de Digne et quelques Points des Basses-Alpes,' par M. Hugues Donzel. Lyon, 1851.

about 1.30, and after a late *déjeuner* at once set off to investigate the first length of the classic "Route du Lac d'Allos," where I hoped to capture in good condition some at least of the butterflies over or on the wane when I was here in 1908. With the exception of July 20th and 22nd, the whole of my collecting at Allos was done between the village and the lake. The mule-path mounts steeply from the one street and then more gently, and sometimes between thick hedges, past meadows already harvested, to the first bridge over the Chadoulin stream. On the southward slopes butterflies were generally in evidence, but more distinguished by quantity than by quality. Here on the lavender tufts—this being about the vertical limit of the plant—the males of *Epinephele lycaon* were freshly emerged. Of the "Blues," *Plebeius argyrognomon* predominated, but the beautiful blue female, var. *calliopis*, Bsdv., of which I had secured a specimen or two at Digne, evidently belongs to the lower levels and the hotter limestone. A few perfect males of *Lycæna arion* haunted the lavender. Here, also, one warm afternoon towards sunset I picked up a curious aberrant form of *Melitæa didyma* settled to roost. On the under side, while all the black spots and lines remain, the usual tawny markings, notably those of the basal and ante-marginal bands of the hind wings, have almost entirely disappeared, giving a peculiar black-and-white chequered appearance to the insect as it sat motionless on the stalk (= *derufata*, n. ab.).

Hereabouts, too, a low hedge fencing a new-mown field was alive with a diminutive race of *Aglaope infausta*, both sexes in fine condition, and with them a few *Adscita pruni* were kicked up from the grass, though neither "Burnets" nor "Foresters" were at all frequent, and at this point the same remark applies to the Hesperiidæ, for which I was chiefly on the alert. But, as everywhere else in the south-east this year, *Satyrus cordula* was abundant; not so *Hipparchia semele*, though possibly it was still somewhat early for the latter.

The only Theclid at all common was *T. spini*, some of the males extraordinarily small, the high Alpes-Maritimes form, as a rule, being of quite the average size. But not one single *T. acaciæ* did I encounter along the line of sloe bushes, where the females were common enough in August, 1908, and where by all rules the males should now have been disporting themselves. *Brenthis amathusia*, also not rare near the bridge in that year, was another absentee. Sailing over the willows I saw not a few superb *Euvanessa antiopa*, with rarer *Limenitis camilla* and *Polygonia c-album*.

A recent writer has remarked on the moisture-loving propensities of the Camberwell Beauty, and I noticed that it would frequently lie with wings flat and fully extended on the stones facing the sun; and also that very occasionally it joined the



Lycænid and Hesperiid "drinking clubs" on the surface damp. They never alighted on the mule-droppings so much affected by mountain Lycænidæ, though *P. c-album* is not above such attractions; and in the spring on the Riviera I have observed that the last-mentioned species is much addicted to the rotten olives left in the orchards from the previous year's harvest. One Sunday afternoon I crossed the bridge here to explore the path through the pine woods, returning along the water channel which diverts a part of the river to supply the farms above Allos. But these woods and slopes yielded nothing beyond swarms of buzzing and biting flies.

The route now ascends sharply on the right bank to the chalets of Champ Richard, and then from a narrow gorge of loose slaty formation debouches on a more open valley, where again the newly constructed path separates from the old, and mounts by zigzags through flowery pastures and occasional larch spinneys. When the sun reaches these upper slopes rather late in the morning there is plenty to occupy attention. *Cænonympha iphis* hardly gives place to *C. arcania* var. *darwiniana*; *Plebeius argus* (*ægon*), much less plentiful than *P. argyrognomon*, gems with wings of lapis-lazuli the red-gold arnica daisies. *Colias phicomone* is everywhere, the females just now in a majority. Males of *Erebia stygne*, *E. goante*, and *E. tyndarus* var. *cassioides* (= *dromus*) cross and re-cross the mule track. The larger Argynnid—*A. aglaia* and *A. niobe* (all var. *eris*)—are already sucking the sweet juices of the purple thistles in company with males of *Chrysophanus hippothoe* var. *eurybia* and *Polyommatus eros*. A little higher still *E. euryale* affects the woods, and the clearings by the roadside are bright with *C. virgaureæ*, *P. pheretes* (males and females), *Parnassius apollo*, and occasional *E. epiphron* var. *cassiope*. About three-quarters of an hour from the last-mentioned bridge a spring empties itself into the torrent; and here over the saxifrage and thick wet moss *P. delius* was flying at a safe distance from the net. Once more the road crosses the stream, and zigzags upward through young forests, the nursery of the Maison Forestière, which now comes into view at a sudden turn. Insects of all orders swarm at this point. The morning is fair and the air delicious with the scent of the many Papilionaceæ, which make a veritable Field of Cloth of Gold, interwoven with the duller purples of the vetches. A mud-bath hereabouts invites a swarm of *P. eros*, *P. hylas*, and *Agriades escheri*; *Lycæna arion* is rare, even more so *P. orbitulus*, which, common in the Swiss Alps, never seems abundant in the Basses-Alpes and Alpes Maritimes. *Hesperia alveus*, *H. fritillum* (= *cirsii*, Rbr.), *H. carthami*, and *H. serratulæ* represent the Black-and-White Skippers; *Thymelicus lineola* and *T. actæon* the Brown. To the "Coppers" may now be added *C. dorilis* var. *subalpina*



of both sexes. High up at the back of the Foresters' House there is a fine piece of rough ground carpeted with soft seeding grasses and alpine flowers. The high fresh wind carries a single *Anthocharis simplonia* male into my net; the infrequent *Pontia callidice* are in rags; but, ascending the last long slope, which ends where the mountains are mirrored in the lake, the *Erebias* once more claim attention.

*E. gorge*, with occasional ab. *erinnys* and *E. mnestra*, swell the catalogue. Within five minutes of the ridge, on the skrees facing towards Allos, and exactly at the point where the path to the Lacs de l'Encombrette diverges to the right, I discovered on my second expedition the headquarters of *E. alecto* var. *duponcheli*, Obthr., thus obviating the grind up Mont Pélat, where it is reported by Mr. Harold Powell. A more harassing insect to chase and capture I do not know. To begin with, the favoured ground is always a weary scramble, composed of loose stones and treacherous for the feet, where the most illusive and blackest of all the *Erebias* flits restlessly over the rock, or rarely pauses to toy a moment with the scanty yellow *Doronicum* patches (I cannot find much to differentiate var. *duponcheli* from ab. *pluto*). Added to this, the nature of the locality ensures for every perfect imago a half-dozen in tatters, while crumpling and failure of wing-pigment is of frequent occurrence. The females were few in number; in vain I watched for one to alight and oviposit and clear up the still outstanding mystery of the food-plant of the species.

Below the path and on the rock-strewn "pelouse" that falls to the mouth of the subterranean stream draining the still invisible Lac d'Allos, *Melitæa varia* is common with *C. phicomone*, as well as the small *Erebias*. Here, also, I took a couple of wasted *H. cacaliæ*, and even more *passés* *H. malvoides*, Elw. and Edw. (= *fritillum*, Rbr.)—the *Dromio* of *H. malvæ*—for the specific confirmation of which I am much indebted to Professor Reverdin, to whom the three or four examples caught at a single sweep of the net were submitted. I do not doubt that earlier in the season this Skipper occurs in most suitable localities throughout the lower Basses-Alpes. Allos, however, may now be added authoritatively to Professor Reverdin's list of French localities published in his masterly treatise on the two species (Bull. Soc. Lépid. Genève, vol. ii. fas. 2, p. 73, 1911). Throughout the valley, from Champ Richard upwards, *H. serratulæ* was frequent; and I have from the same region in my collection a few *Hesperiids*, which seem to me to be intermediates between *H. bellieri*, Obthr., and the var. *foulquieri*, which M. Oberthür retains provisionally under *alveus*, but will, I think, some day not far off be found nearer associated with *bellieri*.

I was surprised to find so few butterflies on the slopes leading down to the matchless lakelet, where in 1908 insects were

fairly plentiful. Except a few shabby *Cassioides* and the ubiquitous *C. phicomone*, there was nothing to tempt me from the rock behind which, and sheltered from the keen wind, I disposed of my lunch. So I devoted the greater part of the time on each occasion to *Alecto-Duponcheli*.

July 22nd, the hottest day of the month, I spent working down the Verdon river-bed, which, in the customary way of Alpine torrent streams, breaks up into many subsidiary channels, leaving broad stony islets covered with dwarf willow, lavender, *Epilobium angustiflorum*, great clumps of *Astragalus alpinus* (?), and tangled vetches, with occasional tufts of wild thyme. The lavender was especially affected by *A. escheri*, *P. argyrognomon*, and females of *C. alciphron* var. *gordius*, the latter in poor condition, while *Anthrocera fausta* gleamed vermilion-winged in equal abundance with *A. carniolica*. The steep cliffs of the right bank, however, disclosed no *E. scipio*, as I had hoped, after a long search for a ford waded knee-deep through spring-cold water. A rare pool for trout at all events; and trout is the *pièce de résistance* of every meal in these delectable mountains. Returning to the causeway at the end of the long poplar avenue, which extends for a mile or so, the valley once more opens out, and on the left bank, where the old road follows the course of the river, there is a sun-burnt stretch of waste land with sparse berberis bushes, mullein, and again some fine lavender in full bloom. *T. actæon*, *A. thersites* and *Issoria lathonia* were the principal visitors; on the dusty upper road *Satyrus circe* was flying with *S. alcyone*, but very little besides, and it was not until I was well in sight of Colmars itself that I could get a draught of drinking water at a hospitable farmhouse, in the garden of which the ripe red currants hung in luscious clusters.

The neighbouring lucerne fields were gay with *Colias edusa* and *C. hyale*, but so great was the heat of the afternoon that at two o'clock I boarded the P.L.M. motor and was quickly rushed back to Allos. Above the village and right up to the Col there is very little promising ground. The slopes on this side are mostly disafforested and grazed close. I tried not to think that the few *Erebias* I saw from the car, when on my journey of the 24th to Barcelonnette, were *E. scipio*. I am now sure they were not—only *stygne*.

I have been asked where, in my Continental wanderings, I have found butterflies in the greatest profusion. It is not an easy question to answer, for "distance lends enchantment to the view" of most entomologists when the time arrives to survey in retrospect the happy hunting grounds of the past. I am inclined to think that certain stages of the road to the Lac d'Allos I have attempted to describe come nearest to El Dorado. Then follow the Eaux Thermales valley at Digne, in June;

St. Martin-Vésubie, or the Ganter Bridge below Berisal, in mid-July; with a far-away April vision of Hadrian's Villa at Tivoli, with its winged legions "fleeing the time carelessly as in Arcady." In point of numbers only, some secluded spots in the Chiltern Hills have provided almost as cheerful an abundance. Last year (1913) the Basses-Alpes were at least blessed with a summer of sunshine and butterflies in striking contrast to the melancholy conditions and the meagre bags reported from Switzerland and Central Europe generally.

(To be continued.)

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## SOME NOTES ON THE LEPIDOPTERA OF LA SAINTE BAUME, VAR, S. FRANCE.

By Rev. F. E. LOWE, M.A., F.E.S.

### II. THE MOTHS.

THOUGH Switzerland can never be without interest, after many years' experience of it the collector begins to crave for new ground. If Norway does not appeal to him, he probably decides to explore as far south as the limits of his time and purse permit. This was my case in the summer of 1912—but—Where to go? was the question. I wisely consulted Mr. Rowland-Brown, to every entomologist a veritable "Baedeker" for France; who, after dismissing my suggestion of Thorenc—of which he had received no reports—proposed La Ste. Baume as being a centre well spoken of by French, and little known to English, collectors. Thither I went therefore, and spent such an interesting ten days that I returned again for a slightly longer visit this year. I had sent a selection of my 1912 captures for identification to Mr. Prout, who is always kind enough to help me out of any difficulties with geometers. It was an unexpected pleasure to hear from him that I had fallen upon a very good thing, *viz.*, *Acidalia determinata*. He wrote: "You have some interesting forms, and *A. determinata* was quite a surprise. I had never even seen the species until a few weeks ago, when Püngler very kindly sent a valuable box of Acidalids for my inspection . . . and included a pair of this species, one from Calabria and one from Taurus. Where exactly is Ste. Baume? It will surely be a new locality for this insect. If you ever visit this place again, work for a series." Here was sufficient incentive, and this year my wife and I returned with ardour to the search, and were successful in getting together about thirty specimens. Perhaps it is early days to express an



opinion, but it appears to be *very* local even where it exists.\* We found it restricted to quite a small space on the edge of the wood which borders the north-east corner of the plateau before beginning the descent to Nans. But its allies, *A. macilentaria* and *A. litigiosaria*, are fairly commonly distributed over all the neighbourhood, more particularly the former. From neither of these could I pretend to distinguish it in flight; but *A. macilentaria*, which is most like it on the upper side, is readily distinguished when caught by its dark strongly-marked under side. *A. determinata* is not an active insect and is easily overlooked, as it seems rarely to fly unless disturbed; but like other "waves," it is fond of lying spread out on a leaf—not, I think, in the full sun, but rather close to the ground, and where longer branches above afford a slight shade. In our experience, it was always driven out of little stunted oak bushes; whether it had any closer connection with these than the fact they provided a pleasant resting-place I cannot venture to suggest. From the list of captures appended it will be seen that the Acidalids proved a strong and interesting family in this region, while the Larentids were remarkably few and ordinary. The Zygenids provided variety, but with the exception of *Z. angelicæ* and *Z. loniceræ* could hardly be considered numerous. That almost most beautiful "burnet" of all, *Z. lavandulæ*, appeared only separately on the road to Nans; but on crossing the Col de Bretagne, I found a large colony feasting on the flowers of "hemp agrimony," or a plant like it, growing in a hollow by the side of the Gémenos road. This, I think, is an unusual occurrence, for at Bondol, where *Z. lavandulæ* was more common, I always took it singly and generally on the wing. *Z. erythus*, on the contrary, has the burnet-habit of congregating, and was seldom seen alone, but had a restricted headquarters of its own; and gave its attentions to a tall wiry scabious with little wizened flowers, which would have been justly despised in any better watered land. Probably the more active habits of *lavandulæ* accounted for a difficulty in getting good specimens. It seems also to be a slightly earlier species. The most remarkable feature in "moth-land," perhaps, was the extraordinary quantity of three small species in the herbage of the plain of Plan d'Aup. I have already remarked in a former paper on the abundance of *Rusticus ægon*. But even more wonderful—especially in 1912—was the enormous number of *Acidalia sericeata* and *A. decorata*, disturbed in walking over the plateau; and with them almost as many *Crambus craterellus*—the only *Crambus* observed, with the exception of two or three *C. cumellus*.

Among the "pugs," Mr. Prout has praise for *Tephroclystia*

\* An indirect but suggestive token of the rarity of *A. determinata* in collections may be gathered from the fact that it is not offered for sale in either the Staudinger, Bang-Haas, or Bartel price-lists.



*allionia* and *T. ultimaria*. The handsome *Ortholitha mæniata* was very common in the woods and at light; and ascending the wooded path to the Col de Bretagne *Minoa murinata*, in spite of its small size, was a prominent feature. The Noctuæ and the *Tephroclystie* were all taken at light, the other families nearly all netted in the daytime, the chief exceptions being *Acidalia virgularia* var. *australis*, *A. submutata*, *Ephyra pupillaria*, *Boarmia solieraria* (one male), *Trephonia sepiaria* (two), *Hylaphila bicolorana*, *Eromene bella*, which were attracted by light.

Besides Mr. Prout, I am also under obligations to Dr. Chapman for naming certain specimens and to Mr. Bethune-Baker for help with the Zygæuids. It is impossible to foresee what system of nomenclature this paper may represent after it has passed the Editor's hands; but in making my list I have followed the Staudinger-Rebelschen Catalog. 1901. As Mons. Culot says in his preface to vol. ii. of 'Noctuelles d'Europe': "Le catalogue que j'ai pris pour guide, parce qu'il est le plus répandu." I hesitate to add with him: "Et non parce qu'il représente une classification rationnelle." Such criticism is for the ever-conflicting experts.

We spent two or three days at Bondol on the sea coast, hunting *Zygæna erythus*. While there I took a few rather good moths at light, and as Bondol is not far distant from La Ste. Baume, I have added these captures as a separate note.

#### HETEROCERA OF STE. BAUME AND NANS.

SPHINGIDÆ.—*Macroglossa stellatarum*, *Deilephila euphorbiæ*, *Hemaris fuciformis*.

LYMANTRIIDÆ.—*Orgyia trigotephras* (var. *corsica*?).

LASIOCAMPIDÆ.—*Malacosoma neustria*.

DREPANIDÆ.—*Drepana binaria* (one female).

NOCTUIDÆ.—*Acronycta rumicis* (dark), *Dianthæcia compta*, *Caradrina exigua*, *Leucania scirpi*, *Thalpocharis polygramma*, *T. purpurina*, *T. scitula*, *Rivula sericealis*, *Prothymnia viridaria*, *Hæmerosia renalis*, *Catocala conversa*, *C. nymphagoga*, *Apopestes dilucida*, *Euclidia glyphica*.

GEOMETRIDÆ.—*Aplasta ononaria*, *Geometra vernaria*, *Nemoria viridata*, *Acidalia ochrata*, *A. macilentaria*, *A. determinata*, *A. rufaria*, *A. litigiosaria*, *A. sericeata*, *A. moniliata*, *A. virgularia* var. *australis*, *A. circuitaria* (two), *A. trigeminata*, *A. dilutaria*, *A. degeneraria*, *A. inornata*, *A. aversata*, *A. rubiginata*, *A. marginepunctata*, *A. submutata*, *A. imitata*, *A. decorata*, *Ephyra pupillaria*, and var. *gyrata*, *E. linearia* (*trilinearis*, Bkh.), *Rhodostrophia vibicaria*, *R. calabraria* and ab. *tabidaria*.

LARENTIINÆ.—*Sterrhæa sacraria*, *Ortholitha mæniata*, *Minoa murinata* (*euphorbiata*), *Larentia fulvata* (one), *L. bilineata* (one), *Tephroclystia* (*Eupithæcia*) *allionia*, *T. breviculata*, *T. ultimaria*, *T. oblongata*, *T. pumilata*, *Rumia luteata* (one).

BOARMIINÆ.—*Boarmia solieraria*, *Trephonia sepiaria*, *Eubolia murinaria*.

CYMBIDÆ.—*Hylophila bicolorana*.

HETEROGYNIDÆ.—*Heterogynis penella*.

LITHOSIINÆ.—*Lithosia lurideola*, *L. complana*, *L. caniola*.

ZYGÆNIDÆ.—*Zygæna scabiosæ* var. *orion*, *Z. sarpedon* and var. *vernetensis*, *Z. achilleæ*, *Z. loniceræ* and var. *ochsenheimeri*, *Z. transalpina*, *Z. angelicæ*, *Z. lavandulæ* and var. *consobrina*, *Z. hilaris* var. *ononidis* (one).

INO (ADSCITA), *I. globulariæ*, *Dyspessa ulula*.

PYRALIDÆ, &c.—*Crambus craterellus*, *C. cumellus*, *Eromene bella*, *Pyrausta sanguinalis*, *P. purpuralis*, *P. funebris* (octomaculata), *P. cingulata*, *Titanio polinalis*, *Evergestis sophialis*, *Salebria palumbella*.

#### AT BONDOL.

*Zygæna erythus*, *Z. filipendulæ*; and at light, *Semiothisa* (Macaria) *æstimaria*, *Guophos mucidaria*, *Eublemma suava*, *E. jucunda*, *Pseudophia illunaris*.

### NOTES ON THE DRAGONFLY SEASON OF 1913.

BY F. W. & H. CAMPION.

THE most interesting dragonfly seen by us during the present year was a female of *Somatochlora metallica* taken in Surrey on June 8th (H. J. Watts). The capture was made in the same locality as that which furnished the male obtained by the same entomologist on June 26th, 1910 (Entom. xlv. p. 238). When first taken, Mr. Watts tells us, this female was in somewhat teneral condition, but it was kept alive for a few days and developed into a very fine specimen. When we saw the insect, after it had left the setting-board, the wings, including the pterostigmata, were of a beautiful amber, the colour being richest in the region of the costa. In a fully adult female from Guisachan, taken in August, 1899, by Mr. J. J. F. X. King, with which we compared the Surrey specimen, the pterostigmata are pinkish-red, and the wings are only slightly tinged with brown. Well authenticated records for this species from any part of Great Britain south of the Grampians are still very few, and its occurrence in Sussex in 1908 came to Odonatists as quite a surprise.

During the last week in May Mr. R. South visited the New Forest, and obtained at Brockenhurst (May 30th) *Calopteryx virgo*, *Pyrrhosoma nymphula*, and *Agrion puella*. From the same locality we also received, through the kindness of Mr. South, *Platynemis pennipes*, *Pyrrhosoma tenellum*, *Orthetrum cærulescens*,

and *Sympetrum striolatum*, all dated July 16th, as well as *Enallagma cyathigerum* and *Erythromma naid*s, likewise taken in July. Furthermore, Mr. South was good enough to give us *Enallagma cyathigerum*, male, caught by himself at the Black Pond, Surrey, on August 13th.

From the Eastbourne district Mr. Harold Bosley kindly sent us *A. puella* (two teneral males, near Pevensey, May 24th), *A. pulchellum* (a teneral pair, near Pevensey, May 24th; two pairs, Eastbourne Marshes, June 14th), and *Ischnura elegans* (two males, Eastbourne Marshes, June 14th).

At Westcliff, Essex, Mr. A. Luvoni recorded *P. nymphula* and *Libellula depressa* on May 25th, *I. elegans* on May 31st, and *A. puella* on June 1st.

During June we re-visited our old Huntingdonshire localities, and, among other species, again met with *Libellula fulva* (near Huntingdon, June 16th and 18th), *I. quadrimaculata* and *Brachytroch hafniense* (near Ramsey, June 17th), *Calopteryx splendens* (near Huntingdon, June 12th), and *Erythromma naid*s (near Huntingdon, June 21st).

Finally, Dr. F. F. Laidlaw has favoured us with a list of the species observed by him in Devonshire during 1913. His report, which is in the following terms, relates to Uffculme, except in the case of those records for which other localities are specially mentioned:—

"The earliest Odonate met with was *Pyrrosoma nymphula*. I saw a female specimen on May 11th, and the species was flying in some numbers the next day. *Calopteryx virgo* put in an appearance nearly a month later than it did last year. I observed the first specimen, a teneral male, on May 23rd, but the species was very abundant by May 28th. On the last-named date I saw very many specimens, and the insect seemed to me to be much more numerous than it was last year. Exactly the opposite was the case with *C. splendens*, which was first noticed on June 15th, but which was never so abundant as in 1912 or so numerous as its congener. *Libellula depressa* occurred on May 26th at Sheldon. *Brachytroch hafniense* was taken at Burlescombe by Mr. H. Pearse on May 27th. I received a female of *B. hafniense* from near Langport, in Somerset, and a female of *Agrion pulchellum*, also from Langport, through the kindness of Miss D. Wright (June 4th). Other records are *Agrion puella* (Willand, June 16th), *Enallagma cyathigerum* (Willand, June 20th), *Cordulegaster annulatus* (September 7th and 19th) and *Sympetrum striolatum*, males, (Burlescombe, September 21st and 28th). On June 27th I saw an *Æschnid* chased in a playful way by a sparrow, which, however, it easily evaded."

*FORFICULA AURICULARIA.*

By H. H. BRINDLEY.

*Forficula auricularia* (slightly magnified).

THE individuals in the photograph reproduced are a female and two males, the latter being as regards length of callipers "high" and "low," following the terminology of Bateson (Proc. Zool. Soc. London, Nov. 15, 1892, p. 585). They were obtained in September, 1913, on the uninhabited islet of Rosevear in the Scillies, situated about two miles east of the Bishop Rock. This islet swarms with earwigs which are mostly large bodied, while the "high" male is much commoner than the "low." Rosevear was inhabited from 1850 to 1858 by the workmen employed to build the present Bishop Lighthouse. Is it possible that the remarkable abundance of earwigs, on an islet whose features are mainly masses of granite and a vegetation of sea-pink and giant mallow, is related to this human settlement of half a century ago? On Round Island, the northernmost islet of the Scilly group, earwigs are also very numerous and seem to feed chiefly on the kitchen refuse thrown "over cliff" by the light keepers, the only human inhabitants.

The specimen illustrated has callipers 12·25 mm. in length, and thus markedly exceeds that taken by Mr. P. M. Bright at Freshwater, Isle of Wight, in 1910, and illustrated in the 'Entomologist,' June, 1911, p. 209. In Mr. Bateson's collection of 1892 in the Farn Islands six specimens had callipers 9·0 mm. long, and in 1907 and 1908 I obtained four from the same locality with callipers 8·75 mm. In a collection made on Round Island in 1911 I found thirty-four males with callipers 10 mm. or more, among which the highest had the value 11·0 mm.



Till I measured the Rosevear specimen the above was the largest "high" male or var. *forcipata* known to me. It is probable that Mr. Bright's Freshwater specimen, on my method of measurement, has callipers slightly more than 10 mm., because they were apparently measured *in situ*. The latter method is quite unsatisfactory when a large series is being measured to ascertain the amount of variation, because the degree to which the bases of the callipers are telescoped into the last abdominal segment differs in a series of individuals. So I always extract the callipers to expose the small process, a kind of condyle, which is situated on the external margin of the calliper and is usually only just hidden by the last abdominal tergum. The callipers are then laid on squared mm. paper and measured in a straight line from the "condyle" to the distal extremity, the curvature being disregarded. This is permissible, because, though "high" males possess straighter callipers than do the "low," as the correlation is constant the curve of variation is not vitiated. Unfortunately the body of the Rosevear "high" male was damaged either at capture or in subsequent transport in spirit, so that it could not be set symmetrically for photographing.

I have not yet measured the other Rosevear males, but there are many which closely approach the example illustrated. Taken altogether they seem to possess in both body and callipers the largest average dimensions of any collection from one locality I have seen.

Zoological Laboratory, Cambridge: December, 1913.

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## THE NEUROPTERA OF NOTTINGHAMSHIRE.

BY J. W. CARR, M.A., F.L.S., F.G.S.

(Professor of Biology, University College, Nottingham.)

THE distribution of these insects in Britain is still so insufficiently worked out that a list of the species recently taken in Nottinghamshire may be of some use. With few exceptions all have been collected during 1912-13 by myself, and every specimen recorded has been identified or confirmed by Mr. Kenneth J. Morton, to whom I am greatly indebted for much generous assistance with this and other groups of Neuropteroid insects.

### SIALIDÆ (Alder-flies).

*Sialis lutaria*, Linn.—By rivers, canals, and ponds everywhere.

*S. fuliginosa*, Pict.—Eaton, near Retford, May 29th, 1901.

### RAPHIDIIDÆ (Snake-flies).

*Raphidia notata*, Fab.—Epperstone Park, May 12th and June

20th, 1912 (J. W. Saunt); Sherwood Forest, near Edwinstowe, June 12th, 1912.

*R. xanthostigma*, Schum.—Sherwood Forest, near Edwinstowe, several, June 10th–14th, 1912; also at Langford Moor, near Newark, June, 1904.

#### HEMEROBIIDÆ (Brown Lacewings).

*Sisyra fuscata*, Fab.—Sherwood Forest, near Ollerton, July, 1912.

*Hemerobius elegans*, Steph.—Burton Joyce, July 9th, 1904.

*H. micans*, Oliv.—Thorney, August, 1913 (L. A. Carr); Epperstone Park, September 6th, 1913.

*H. nitidulus*, Fab.—Epperstone Park, September 6th, 1913.

*H. humuli*, Linn.—Nether Langwith, August 19th, 1912; West Leake, May 27th, 1913; Epperstone Park, September 6th, 1913.

*H. lutescens*, Fab.—Common. Nottingham; East and West Leake; Kirkby-in-Ashfield; Epperstone Park; Thorney; Sherwood Forest, &c.; dates varying from May 17th to September 24th.

*H. orotypus*, Walleng. Aspley Woods, near Nottingham, August 9th, 1912; Sherwood Forest, near Edwinstowe, September 25th, 1913.

*H. nervosus*, Fab.—Epperstone Park, September 6th, 1913.

*H. subnebulosus*, Steph.—Everywhere common. Taken continuously from April 24th to September 12th.

*H. quadrifasciatus*, Reut.—Sherwood Forest, near Edwinstowe, June 10th–14th, 1912 (L. A. Carr).

*Micromus payanus*, Linn.—Aspley Woods, June 28th and July 26th, 1912; Kirkby-in-Ashfield, June 28th, 1913.

*M. angulatus*, Steph.—Sherwood Forest, near Edwinstowe, September 25th, 1913.

#### CHRYSOPIDÆ (Green Lacewings).

*Chrysopa flava*, Scop.—Holme Pierrepont, June 1st, 1912 (F. M. Robinson); Caythorpe, September, 1912; Kirkby-in-Ashfield, June 28th, 1913.

*C. alba*, Linn.—Epperstone Park, June 22nd, 1913 (J. W. Saunt).

*C. tenella*, Schrd.—Bulwell Hall Park, July 8th, 1912.

*C. septempunctata*, Wesm.—Ollerton, Sherwood Forest, July, 1912; Nottingham, common on hawthorn trees in my garden and elsewhere in the city.

*C. prasina*, Ramb.—Sherwood Forest, near Edwinstowe, August 1st, 1911.

*C. ventralis*, Curt.—Nottingham, 1912 (J. W. Saunt).

*C. phyllochroma*, Wesm.—East Leake, June 13th, 1912.

*C. perla*, Linn.—Budby-carr, Sherwood Forest, several, July 9th, 1913; Worksop, 1913 (J. E. Hodding); Cotgrave, June 21st, 1913 (Saunt).

#### CONIOPTERYGIDÆ.

*Conwentzia psociformis*, Curt.—Nottingham, May 27th, 1913; Warsop, July 14th, 1913.

*Semidalis aleyrodiformis*, Steph.—Nottingham, 1901; East Leake, July 3rd, 1911; Upton, near Southwell, beaten from ash and oak, June 30th, 1913; Fiskerton, from *Pyrus malus*, July 25th, 1913.

*Coniopteryx tineiformis*, Steph.—Thorney, August 15th–19th, 1913 (L. A. Carr).

PANORPIDÆ (Scorpion-flies).

*Panorpa communis*, Linn.—Common throughout the county, June 12th–August 24th, 1913.

*P. cognata*, Ramb.—Bulwell, July 6th, 1912 (F. M. Robinson); Thorney, August 15th–19th, 1913, two specimens (L. A. Carr); near Newbound Mill, Teversall, August 3rd, 1912.

*P. germanica*, Linn.—Common everywhere in Notts; taken from May 11th to September 12th.

[In addition to those above mentioned, the following species have been recorded for Nottinghamshire:—

*Hemerobius inconspicuus*, McLach.—Clumber Park, 1908 (Lady Robinson).

*H. stigma*, Steph.—Worksop, 1904 (Lady Robinson).

*H. atrifrons*, McLach. and *H. concinnus*, Steph.—Worksop, 1908 (Lady Robinson).

*Chrysopa vulgaris*, Schrd.—South Leverton (Rev. A. Thornley); Shireoaks, Worksop (J. T. Houghton).

*Nothochrysa capitata*, Fab.—Sherwood Forest (H. Donisthorpe).]

## A NEW GENUS OF TRYDYMINE MISCOGASTERIDÆ (HYMENOPTERA CHALCIDOIDEA).

By A. A. GIRAULT.

### TRYDYMINI.

#### EPITEROBIA, n. gen.

*Female*.—Agreeing with *Terobia*, Foerster, but the scutellum with a distinct cross suture before apex, and the marginal vein is fully twice the length of the stigmal, which is distinctly shorter than the postmarginal. Both mandibles flattened, distinctly 4-dentate. Abdomen conic-ovate, keeled beneath, the second segment longest, occupying about a fifth of the surface, its caudal margin with a slight notch at the meson; abdomen somewhat longer than the rest of the body. Antennæ with the first ring-joint very short, inserted below the middle of the face but somewhat above the ventral ends of the eyes. Lateral margins of propodeum carinated, but true lateral carinæ absent, the median carina distinct, not very long, complete. Spiracle small, round, *central* (i. e. midway between cephalic and caudal margins, far from cephalic margin). Parapsidal furrows deep.

*Male*.—Not known.

*Type*.—The following species.

#### *Epiterobia reticulatithorax*, n. sp.

*Female*.—Length, 1.15 mm. Dark coppery green, the wings hyaline, the thorax finely reticulated, the lines not raised, smooth on scutellum caudad of cross-suture; propodeum glabrous. Coxæ con-

colorous, the femora also, the knees, tibiæ and tarsi pale. Mandibles somewhat like an outspread hand with the last finger-joints turned down and the thumb hidden. Antennæ pale yellowish, the pedicel above at base and the club dusky. Club somewhat enlarged; funicle joints subglobular, wider than long, increasing somewhat in size, distad, but always shorter than the pedicel, which is a little longer than wide. Club apparently with a minute apical fourth joint (excluding this, antennæ 13-jointed with two ring joints).

Described from one female captured by sweeping in forest, December 2nd, 1912 (A. P. Dodd).

*Habitat*.—Nelson (Cairns), Queensland.

*Type*.—The above specimen on a tag, the head and a hind leg on a slide. In the Queensland Museum, Brisbane.

The species was described with a Bausch and Lomb microscope,  $\frac{2}{3}$ -inch objective, 1-inch optic.

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## NOTES AND OBSERVATIONS.

DO HOUSE-FLIES HYBERNATE?—It is commonly believed that the persistence of *Musca domestica* from one season to another is ensured by the survival of a certain number of fertilized females, which pass through the winter usually in a dormant condition in nooks and crannies in houses, and become the mothers of the earliest broods of the following year. In spite, however, of the large amount of attention bestowed upon the House-fly during the last few years, owing to the recognition of its importance as a disease-carrier, definite proof that the insect hibernates in the perfect state is still wanting; indeed, Dr. Henry Skinner, as the result of an observation made by him last March at Philadelphia, U.S.A., has recently answered the question at the head of this note by stating that: "House-flies pass the winter in the pupal stage and in no other way" ('Entomological News,' vol. xxiv, No. 7, July, 1913, p. 304). This conclusion, it should be noted, is directly at variance with results obtained in this country by both Newstead and Jepson.

Did we possess exact knowledge of what happens to the House-fly in the interval that elapses between the disappearance of the last belated stragglers in November and December, and the sporadic invasion of our dwellings in the following June by the earliest skirmishers of the season, it is obvious that we might be able to deal more effectually with an ever-recurring menace to the public health. This point has not been overlooked in the investigations upon "Flies as Carriers of Infection," which for several years past have been carried on by the Local Government Board, under the direction of Dr. S. Monckton Copeman, F.R.S., but hitherto the results have been purely negative. Hybernating flies belonging to several species have been found in attics and elsewhere, but upon careful examination it was found that these did not include a single House-fly. In this matter the importance of accurate determination of species is obvious, and the object of the present note is to enlist during the



present winter the sympathetic aid of readers of this Journal, in securing and forwarding for identification collections of hibernating flies. Such flies may be looked for in attics and other unoccupied rooms, in chinks and crannies in living rooms, such as the space between a shutter or a loose piece of wall-paper and the wall, and in stables, barns and other outbuildings close to houses. Every consignment of flies so collected, if forwarded (with label stating place and date of capture) either to Dr. S. Monckton Copeman, F.R.S., Local Government Board, Whitehall, S.W., or to the writer, will be gratefully and promptly acknowledged and investigated. The flies should be placed, just as they are, in a small tin box or wide-mouthed bottle, well protected by soft wrapping and despatched by parcel post. Such parcels, if sent to Dr. Copeman at the Local Government Board, and marked "O.H.M.S.," need not be stamped.—ERNEST E. AUSTEN; British Museum (Natural History), Cromwell Road, London, S.W., January 10th, 1914.

NOTES FROM SALCOMBE, AUGUST, 1913.—*Colias edusa* was first seen on the Kingsbridge Road on August 10th after church, and was apparently a freshly emerged male. There was a large clover field a short distance away, but although the field was visited on all suitable occasions for several days, and at intervals until the end of the month, not a single other specimen was seen in that neighbourhood. On August 15th a male appeared on the tennis courts and was promptly acquired with the help of a racquet. The same day my wife discovered the species flying quite freely in a steep stubby field on the Portlemouth side of the harbour. A few specimens were generally to be found there in sunshine for the next ten days, when they became scarcer. It was a great pleasure to find *Vanessa io* commoner than I have seen it for thirty years. It occurred almost everywhere, but swarmed in some of the ravines on the Bolt, where at least half a dozen on one occasion were feeding on an inaccessible clump of valerian, its chief attraction. No doubt these were the imagines from the larvæ noted as common at Salcombe by Mr. R. M. Prideaux on July 1st. *V. io* was in the pink of condition, a large percentage being absolutely perfect and very fine. *Pyrameis cardui* were very common in the clover field and in good condition. *P. atalanta* appeared frequently towards the end of the month. On August 19th a number were flying on the sandhills at Hope, where they were greatly attracted by the *Eryngium*, then in full bloom. *Argynnis paphia* was about over, but a few were seen in the Courtenay Woods and on the Bolt. *Satyrus semele* was common on the barer part of Bolt Head, but was worn, and only four perfect specimens was taken. *Pararge egeria* was numerous in all suitable localities and in all conditions. *Pararge megæra* and *Epinephele tithonus* swarmed on the banks at the sides of the high roads, but both were dilapidated. *Canonympha pamphilus* and *Chrysophanus phleas* were present in some numbers in the *edusa* field and less commonly elsewhere. *Lycæna astrarche* occurred in one corner of the same field, but was confined to a space of about fifteen yards square, and it was met with nowhere else. *L. icarus* was the only blue seen, and not a single skipper or hairstreak was noted.

*Eupithecia* larvæ were common on *Galium*, *Artemisia*, and *Senecio*. Dusking was not very successful, and sugaring on the cliffs was unproductive during the greater part of the month. By far the most common insect at sugar in the Courtenay Woods was *Amphipyra pyramidea*, which came freely during the last days of our visit. On one occasion five were successfully boxed from one patch. Four *Lymantria monacha* came to the lantern one night in a pine wood. The flowers of *Senecio* near the sea were not worth working, although in 1912 at Sutton-on-Sea common species swarmed on it. —G. HANSON SALE; Littleover House, Littleover, Derby.

MOTHS CASUALLY PASSING MORE THAN A YEAR IN THE PUPAL STATE.—Mr. Robert Lawson's note upon some examples of *Biston hirtaria*, which spent nearly three years as pupæ with him (Entom. xlv. p. 332), interests me much, as I have long suspected that to something of this kind may perhaps be attributed the extra abundance of certain insects in certain years so often remarked upon. I have had several species of caterpillars from time to time in my rearing cages, that have missed the usual time of emergence, and duly turned to imagines in the following year; but will, meanwhile, only mention one case which is curiously like that referred to by Mr. Lawson. In August and September, 1888, larvæ of *Notodonta ziczac* happened to be unusually numerous round Berwick-on-Tweed, and a number of them were transferred to the breeding cages. Most of these duly emerged in the following year, from May 22nd up to July 14th, but a few pupæ remained alive in the cage till 1891, when one perfect insect emerged from one of them on July 18th, none of the remainder being then alive. But the point I particularly wish to emphasize is that, although upon the poplar trees from which the larvæ had been gathered in 1888, no *ziczac* caterpillars appeared in either 1889 or 1890, in the autumn of 1891 they were again numerous. It might, of course, have been no more than a coincidence, but it strongly suggested some conditions, climatic or otherwise, especially favourable to the species, and common to the years 1888 and 1891; as well as that certain of the wild insects might also have passed the intervening two summers in the pupal state.—GEORGE BOLAM; Alston, Cumberland.

LITHOSTEGE GRISEATA SECOND BROOD.—I had a few larvæ of this species last year which duly pupated, and I was much surprised to find on looking at the cages in September that five moths had emerged (two males and three females). They had evidently paired and laid, as there were some old eggshells about, but the larvæ had of course perished. This may account for the scarcity of the species some seasons, as if there is a second emergence the resulting larvæ would surely perish, as the *Sisymbrium* would be dying and the seeds fallen before the larvæ could feed up.—H. M. EDELSTEN; Forty Hill, Enfield.

"THE VERRALL SUPPER."—No entomological event of the year, as we have before asserted, is of greater social interest or of more value for founding friendships than the "Verrall" supper, which annually perpetuates the memory of those given by the late G. H. Verrall and that of the donor. In 1913 the number of guests was

but little under one hundred, but on January 20th of the present year that record was broken, as one hundred and three then sat down to supper. Among those present were Adkin, Andrews, Arrow, Atmore, Black, Bateson, Bethune-Baker, Bouskill, Burr, Bagnell, Bacot, Bethel, Blair, Butler, Buxton, G. C. and H. G. Champion, Chapman, Collin, Cameron, Campion, Cockayne, Crawley, Dixey, Donisthorpe, Druce, Durrant, Stanley and F. W. Edwards, Elliott, Frohawk, Frisby, Fryer, Gahan, Gibbs, Hall, Harmer, Hodge, Image, O. E. and J. O. Janson, Jackson, Jenkinson, Jennings, Jones, Joy, Jordan, Joseph, Lloyd, Lucas, Main, Meade-Waldo, Mitford, Morley, Morice, Nurse, Nicholson, Porritt, Poulton, Prout, W. Rothschild, Rowland-Brown, Riley, W. E. Sharp, Sieh, Skinner, Smith, Step, Tomlin, Tonge, Turner, Wainwright, Walker, C. O. Waterhouse, and Wheeler.

A DRAGONFLY AT SEA.—The dragonfly taken at sea mentioned on p. 39 has been kindly identified for me by Mr. W. J. Lucas. It is a fully coloured male of *Sympetrum scoticum*. It was taken between Revel and Helsingfors, the former name being previously misprinted as "Kevel."—JOHN B. HICKS; Stoneleigh, Elmfield Road, Bromley, Kent, Jan. 8th, 1914.

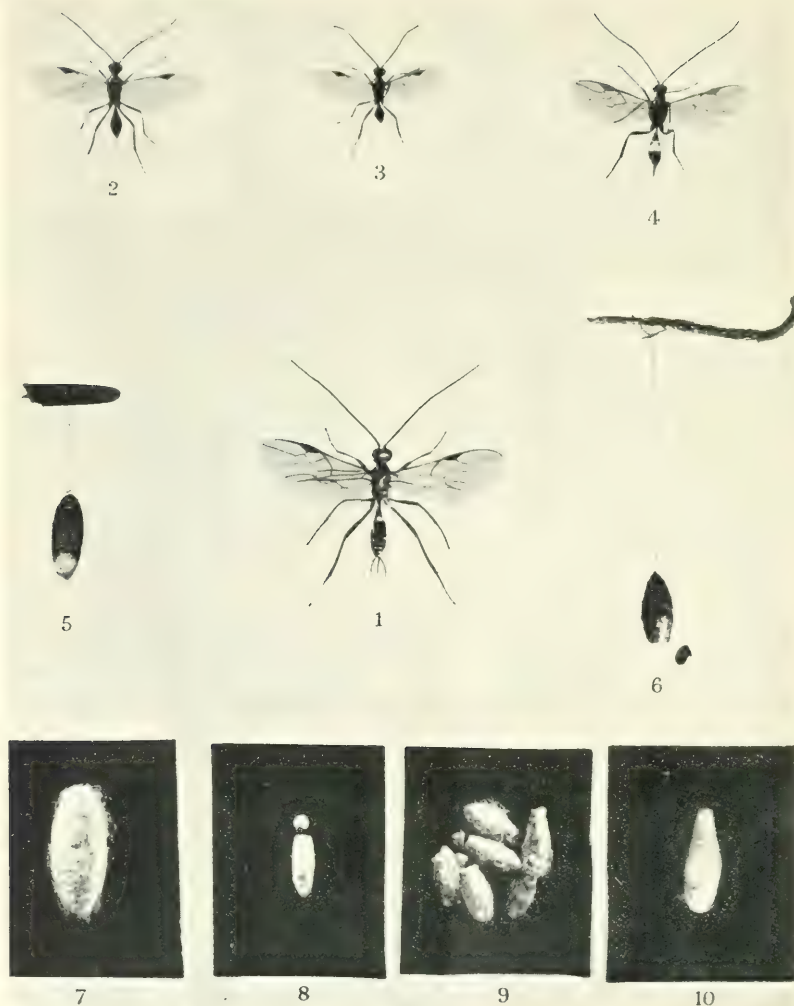
ERRATA.—Page 27, line 13 from bottom, delete "*croricnus*." Page 36, line 10, for "*samoensis*" read "*samoensis*." Page 37, line 19, for "no posterior" read "two posterior"; line 24, for "Thorp" read "Theobald."

## SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—November 17th, 1913.—The President in the chair.—Mr. W. Bowater, B.D.S., F.E.S., Brandon Lodge, Russell Road, Moseley, Birmingham, and Arnold W. Hughes, 33, Lacy Road, Everton, Liverpool, were elected members of the Society.—Dr. P. F. Tinne read a paper entitled "Insects concerned in the Pollination of Plants," in which he dealt very thoroughly with the part played by insects in this important process. Dr. Tinne gave many interesting examples, chiefly drawn from the Hymenoptera and Lepidoptera, as to the methods of the various species; he described the structure of the floral organs of plants which facilitated the operations of the insect principally concerned in the pollination; and also indicated how unwelcome or inefficient visitors were repelled and imprisoned or otherwise prevented from interfering with the process.—The following exhibits were made:—By Mr. W. A. Tyerman—A fine bred series of *Notodonta dromedarius* var. *perfusca*, *Dianthæcia nana*, *D. cucubali*, and *Phibalapteryx vittata*, from the Southport district; also *Sphinx convolvuli*, *Nemeophila plantaginis*, and *Callimorpha dominula*. A specimen of *Charocampa nerii*, captured by a farmer near Ainsdale on September 14th, 1913; it was in a very dilapidated condition, but easily recognisable, and it forms a very interesting addition to our county list.—Mr. W. Mansbridge showed a short series of *Thera variata* and pale forms of *T. obeliscata* for comparison.—WM. MANSBRIDGE, *Hon. Sec.*







Photos G. T. Lyle.

1. *Meteorus albiditarsis*, female.
2. *M. niger*, female.
3. *M. niger*, male.
4. *M. fragilis*, female.
5. Cocoon of *M. melanostictus* from which the hyperparasite *Mesochorus crassimanus* emerged.
6. Cocoon of *M. pulchricornis* showing the cap removed by the imago in emerging.
7. Cocoon of *M. albiditarsis*.
8. Cocoon of *M. ictericus*.
9. Cocoons of *M. leviventris*.
10. Cocoon of *M. deceptor*.

# THE ENTOMOLOGIST

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[No. 610

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE  
BRITISH BRACONIDÆ. No. I. METEORIDÆ.

By G. T. LYLE, F.E.S.

(PLATE I.)

Writing in 1898, the late George Carter Bignell, to whom we owe, perhaps, more of our knowledge of the British Braconidæ than to any other, mentions that the number of British students of the Ichneumonidæ during the nineteenth century would not amount to a dozen. As regards the Braconidæ, since Bignell published his South Devon list in 1901,\* I am not aware of any literature having appeared on the subject in this country, with the exception of a few scattered notes in various periodicals, and Mr. Claude Morley's papers which were published in the 'Entomologist' for 1906, 1907, and 1908.

There would seem to be several reasons for this neglect of a most interesting group, one being the want of a cheap text-book on the subject to encourage the young student, and another the fact that several authors have described new species from insufficient material, often from a single specimen, so that where species run so closely together and individuals vary so much, a certain amount of confusion has arisen. The Rev. T. A. Marshall, however, did much to dispel this in his excellent monograph, published in the Trans. Ent. Soc. 1885-1889, and even more in his three volumes on the Braconidæ comprised in 'Species des Hyménoptères d'Europe et d'Algérie,' 1888-1901.

During the past ten years I have given a good deal of attention to the breeding of hymenopterous parasites, and although the work has been considerable I feel that the results have repaid me, as in no other way could a knowledge of the life-histories of the insects be obtained. I am also much indebted to various gentlemen who have been good enough to present me with specimens which they have bred, often, I fear, much to their disgust, and particularly to Mr. Claude Morley who has

\* 'The Ichneumonidæ of S. Devon,' part 2, Braconidæ, Trans. Devons. for Advan. Sci., Lit. and Art.

very kindly forwarded to me the whole of his collection of Meteoridæ for inspection.

Ashmead, in his classification of the Ichneumonidæ,\* divides his subfamily Meteorinæ into five genera, restoring *Zemiotus* and *Protelus* (Forster) which had been rejected, apparently for very good reasons, by Marshall. For convenience sake, however, I will treat our British representatives as of but one genus, *Meteorus*, Hal.,† as did Morley in his notes‡.

The British species are comparatively few in number, some thirty-five or so having been recorded, including two or three rather doubtful ones. They are distinguished by having three cubital areolets on the fore wings, and, as in the true ichneumons, a petiolated abdomen. While usually parasitic on the larvæ of Lepidoptera, some are known to prey on the larvæ of Coleoptera, and Morley has published a record of *M. versicolor* having been bred from the larva of a Tenthredinid.

From April until late autumn they are to be found on the wing, and although I have no knowledge that they ever hibernate in the perfect state, it is possible that at least *M. filator*, which has often been taken in November, and *M. melanostictus* which I have found so late as December 17th, may do so.

Most of the Meteoridæ are solitary parasites, though a few are social; of the former several weave brown shining cocoons which are suspended by a silken thread from leaves or twigs of the plant on which the host has fed. This swing rope is generally from a half to two inches in length, though I have known it to reach eight inches. Marshall writes of these cocoons§: "The head of the insect is always turned downwards, and, as it spins by the mouth, we have to account for the fact that somehow it is able to reverse its position in the air, since at the moment of its first suspension the head would naturally be uppermost; so far as I know, no observation has yet been made to explain this circumstance." With regard to this, I have several times watched the larva of *M. pulchricornis* emerge from its host, and the proceeding is somewhat as follows:—The head of the parasite larva is, of course, protruded first, and when about half the body is free a pad of silk is spun on the leaf or twig on which the host rests; after this the remainder of the body is withdrawn, and the parasite lowers itself from the pad by a thread of silk, the head being uppermost, as mentioned by Marshall. By a severe muscular effort, which is not always successful at the first attempt, the apical segment is now brought up until it touches the mouth, and apparently the thread is grasped between the apical and the adjoining segments, the

\* Proc. U. S. Nat. Mus. vol. xxiii. 1900.    † Halliday, Ent. Mag. iii. p. 24.

‡ 'Entomologist,' 1908, p. 125.

§ Trans. Ent. Soc. 1887, p. 89.

|| Berthoumieu describes the pedal processes on the apical segments of larvæ of Ichneumonidæ in Ann. Soc. France, 1895.

attachment being at once made secure by the addition of a few twists of silk, after which the head is drawn away leaving the larva suspended by its anal extremity; the formation of the cocoon is then commenced. Some two hours are occupied by the larva in covering itself with the cocoon, but for many hours afterwards it may be seen hard at work spinning within.

In all the cases observed by me the parasite larva emerged from the side of the seventh or eighth segment of the host, I believe, through a spiracle.

As I mentioned before, I know of no instance of a Meteorid hibernating in the perfect state, but with several species the winter is passed within the body of the host, either as an ovum or young larva, and with a few others as a larva within the cocoon. My experience is that pupation does not take place until within a fortnight or so of the emergence of the imago, no matter how long a period may be spent within the cocoon. On emerging, the imago removes a neat cap from one end of its cocoon (fig. 6); with those species which construct fusiform cocoons the cap is always removed from the smaller end.

In the following notes, unless otherwise stated, the records are my own, and the insects mentioned have been captured or bred in the New Forest.

*Meteorus albiditarsis* (Curtis).\* (Fig. 1).—This, the largest species we have, may easily be distinguished from all other British Meteoridæ by having the radial areolet of the under wing divided by a *distinct* transverse nervure. It seems to be generally distributed and is fairly common in May and June; on those dull cold days which are, as a rule, only too frequent in the late spring, it may often be beaten from thorn bushes.

A solitary parasite of the larvæ of Noctuæ, the parasite larva emerging from the host when the latter is about to pupate in its subterranean earthen cocoon, within which the cocoon of the parasite is constructed. Marshall well describes this cocoon as "felted stramineous with some loose flocculence"; it consists of three layers, outside the "loose flocculence," which easily comes away when the cocoon is handled, then the cocoon proper, which is rather similar in colour and texture to that of the "silk worm" of commerce, and within this a thin transparent, brownish envelope of a material much resembling goldbeater's skin. On October 1st, 1913, I exhibited at a meeting of the Entomological Society of London a skein of silk wound from two of these cocoons (fig. 7).

At least a period of ten months appears to be spent in the larva state, in which condition the winter is passed within the cocoon. I believe that sometimes even a second winter is so

\* 'British Entomology,' pl. ccccxv.



passed, for a cocoon which was spun in June, 1912, was found to still contain the larva, living and unchanged, in September, 1913.

The female somewhat resembles *Zeletestaceator* (Curtis), with which species it has frequently been confused in collections; in *Zeletestaceator*, however, the recurrent nervure is very widely rejected, and the abdomen does not possess a true petiole, as in *Meteorus*.

I have bred it from a cocoon dug up at roots of an oak tree, April 14th, 1904, from larva of *Tæniocampa miniosa*, May 11th, 1913, and also from larvæ of *T. gracilis*, *T. pulverulenta*, *T. stabilis*, and *Panolis piniperda*.

*M. chrysophthalmus* (Nees).\*—I possess a male, beaten from birch, May 5th, 1912, which I must refer to this species, as the costal cell is slightly longer than the median. Very similar to the next, though the females differ in the length of the terebra.

*M. deceptor* (Wesm.).†—Generally bred from larvæ of Geometræ, a solitary parasite. The cocoon is white, felted, fusiform and without loose flocculence; it is found within that of its host, which is usually underground,  $9\frac{1}{2}$  mm. in length (fig. 10). I have obtained this parasite from larvæ of *Gonodontis bidentata* and *Semiothisa liturata* in May. Single brooded, the winter being passed in the larva state within the cocoon.

In Morley's collection is a pair bred by Clutten at Burnley, from larvæ of a geometer; in this case the male is testaceous and not nigropiceous.

*M. ictericus* (Nees).—Marshall considered this to be "perhaps the commonest British species." Although fairly plentiful, there are certainly others that are far more so, at any rate, in the New Forest.

It would seem that Curtis, Halliday, and other writers confused this species with *M. pulchricornis*, and even Marshall cannot have seen the cocoon, for he assumes Curtis's figure to be correct, and describes it as "pensile, yellowish brown, shining, and semi-transparent." Bignell, however, is correct in saying that it is "white and very thin," and so early as 1834 Bouché‡ described the cocoon as "albus chartaceus" and not pensile. All that I have seen agree with the descriptions of Bignell and Bouché, being cylindrical, not fusiform, and constructed within rolled leaves. The transformations of the insect are visible through the cocoon (fig. 8).

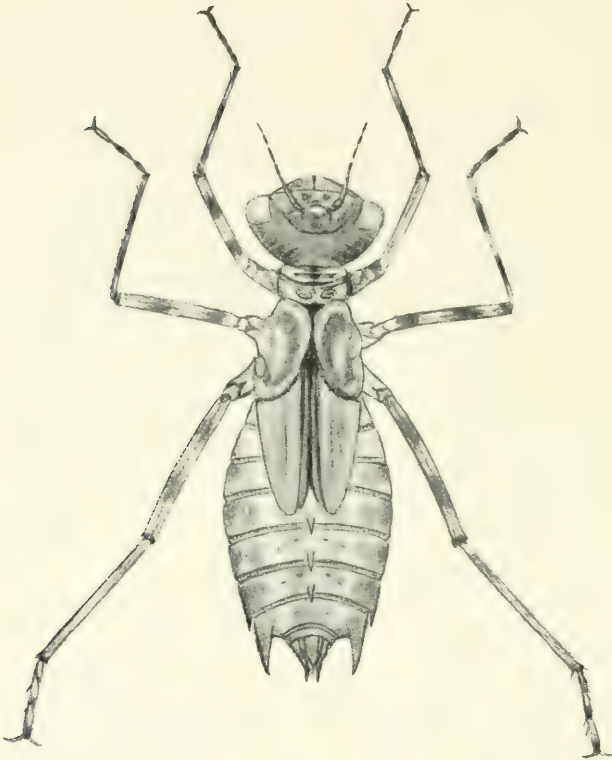
Generally bred from larvæ of Tortrices, a solitary parasite. I have obtained it from a cocoon found on oak, June 6th, 1910 (New Forest), and also from larvæ of either *Sericoris fabricana* or *S. lacunana* taken at Burgess Hill, Sussex, May, 1911. In Morley's collection is a female bred by R. Adkin, October 12th, 1910, from a larva of *Tortrix pronubana*, and two males bred by

\* Nees-ab-Esenbech. Hym. Ich. Affinium Mon. vol. i. 1834.

† Wesmael, Nouv. Mém. Ac. Brux. 1835.

‡ Naturgesch. d. Ins.





W. J. Lucas del.

SYMPETRUM STRIOLATUM.

NYMPH (x. about 4).

R. South from larvæ of *Peronea hastiana*, October 13th, 1904, and October 21st, 1904, host from St. Anne's, Lancashire.

*M. vexator* (Hal.).—Is easily known by the size of the stigma, which is as large or even larger than the first cubital cell, with a considerable pale spot at the inner angle. We are indebted to Morley for redescribing this species,\* from specimens bred by Keys at Plymouth out of a fungus, together with the clavicorn beetle *Diphyllus lunatus* (Fab.). Halliday described the female from a single insect, while Marshall, who described its supposititious male, had only a dilapidated specimen before him. In Morley's insects the antennæ of the male are 26-jointed, of the female 24, and the recurrent nervure is rejected.

*M. atrator* (Curtis).—In August, 1913, C. W. Colthrup sent me from Eastbourne two females which he had captured with three specimens of the hyperparasite *Hemiteles areator*. The insects were caught while running about on furniture which was infested with the moth *Tinea biselliella*, and were evidently searching for the larvæ of the lepidopteron. Morley has a female which was also taken indoors. I believe that no specified host has before been cited for this species, and it appears to have been but rarely observed, which seems strange in the case of so beneficial an insect.

(To be continued.)

## BRITISH ODONATA IN 1913.

By W. J. LUCAS, B.A., F.E.S.

(PLATE II.)

ALTHOUGH the spring was an early one, I did not meet with a dragonfly till May 18th, when *Pyrrhosoma nymphula* and *Libellula quadrimaculata*, the latter in teneral condition, were taken at the Black Pond, near Oxshott, in Surrey; no other species was seen—not even *Enallagma cyathigerum*. On May 25th the same locality was again visited, when a male and a female of *Cordulia ænea* were taken, and *E. cyathigerum* was on the wing, as well as *P. nymphula* and *L. quadrimaculata*; but, on the whole, dragonflies were not very evident in a locality where they are usually so plentiful by this date.

On June 1st a visit was paid to Frensham Ponds and the swampy ground near them, in the south-west corner of Surrey; but the weather was dull. However, *E. cyathigerum* was found to be numerous. There were also a few *I. elegans*, and a female *Agrion puella* was taken. One or two teneral examples of

\* Entom. p. 4, 1912.



*Orthetrum cancellatum* were met with at the larger pond, and a nymph-skin was secured. *Calopteryx virgo* occurred in a wet field near the smaller pond, most of the females taken being very dark. On June 8th, another dull day, the canal-side at Byfleet was visited. Owing to the weather, no doubt, dragonflies were not numerous, but *A. puella*, *P. nymphula*, and *Erythromma naia*s were captured.

During the first half of June Col. J. W. Yerbury captured for me a few dragonflies in the north of Scotland. They were—*Leucorrhinia dubia*, a male, June 3rd, at Nethy Bridge; *P. nymphula*, a female, June 4th, at Aviemore, grasping its prey, a caddis-fly named *Limnophilus centralis*; *E. cyathigerum*, three males and a female, at Aviemore, from June 6th–16th, the male taken on the 16th holding its prey, a small moth named *Crambus pratellus*; *Agrion hastulatum*, nine males and two females, at Aviemore, from June 9th–16th. The last-named species varied much in the development of the lateral marks on the second segment of the abdomen, and from two they were nearly or quite absent. Females of this species seem seldom to be captured. On June 21st Mr. P. Richards found *I. elegans* in swarms at Seabrook, in Kent, and sent me a male for identification. On July 29th Col. Yerbury obtained a male *P. nymphula* at Mynydd Eppint, in Wales, at an altitude of about 1500 ft.; no other dragonfly was seen.

In the New Forest, from June 27th–29th, dragonflies were found to be fairly numerous. *A. puella*, *Platynemis pennipes*, *P. nymphula*, and *Orthetrum cærulescens* were common, but the last species was in teneral condition. *Calopteryx virgo* was out in fair numbers, and there were a few *I. elegans*, one being obtained of the var. *rufescens*. Of *Pyrhosoma tenellum* one female was taken, but of *Cordulegaster annulatus* I am not certain that I saw a single specimen, although, judging by other records, it should have been on the wing by this date. Neither *Agrion mercuriale* nor *Ischnura pumilio*, nor *Gomphus vulgatissimus* was met with, although a special search was made for the last two. A week later, July 4th–6th, again the same two species were not to be seen; but *A. mercuriale* was taken plentifully behind Holm Hill, one only, however, being a female, which was found to be attacked by red acari. On this occasion *P. tenellum* was met with again.

From July 27th onwards some time was spent in the New Forest, and on July 28th a visit was paid to the pond on Beau-lieu Heath, where *Sympetrum fonscolombii* was taken in 1911. Though I sought for over an hour in the bright, hot sunshine, the only dragonflies found were *Lestes sponsa*, *P. tenellum* (and its var. *melanotum*), *I. elegans*, *E. cyathigerum*, *O. cærulescens*, a *Libellula depressa* and an *Anax imperator* somewhat doubtfully, and *Sympetrum striolatum*. I feel certain that amongst the last

was not a single *S. fonscolombii*, though offspring of the 1911 specimens, if they had bred there, would probably have been due in 1913. Mr. F. H. Haines, of Winfrith, Dorset, was a little more successful with this species. Writing August 3rd, 1913, he told me that on July 24th he saw several specimens on a pond at Morden and took a male and female *in cop.*; as well as a second male. They were in nothing like the abundance of 1912, and their wariness was wonderful. He might have made twenty captures of *S. striolatum* for one of *S. fonscolombii*. On July 25th he tried West Knighton pond and thinks he saw one of the latter species, but could not capture it. A friend of his having reported the species at Creech, south of Wareham, on August 2nd they together visited both Creech and Morden, but found nothing, though *S. striolatum* was abundant at Creech, and they took an *Æschna juncea* and a worn *A. imperator* at Morden. Mr. Haines did not find the pond at Creech such a one as he would associate with *S. fonscolombii*, although his friend knew the dragonfly. It prefers heathland ponds, fed by swamps with much decomposing vegetable matter in them all round, causing the water to be very warm. The Creech pond was deep and cold. He thought perhaps a swarm might have paid a visit and passed on. Some days previously he found the species still well in evidence at Morden and took another male. So this year he has four specimens, three males and one female—three taken on one day, one on another.

On August 1st *C. annulatus* was common at Beaulieu River, and from this time there appeared to be no dearth of them in the Forest, so the adverse season of 1912 had not affected the 1913 imagines. On the same date an *Æschna cyanea*, female, was captured, apparently but recently emerged, as the spots were whitish-blue. On the next day an *Æ. juncea* was captured at Woodfildley. On August 16th in the central part of the Forest dragonflies were numerous, almost all being *S. striolatum*. On August 25th I could not find *A. mercuriale*, and presume it was over. *I. pumilio* I was not able to find at all during the season. Towards the end of August *C. virgo* had disappeared.

Mr. W. H. Harwood tells me that a specimen of *Æschna isosceles* was taken at Wicken Fen on September 28th, which seems to be a very late date for this species.

After a long absence, a visit was paid to the Black Pond on September 28th, when *S. striolatum* and *S. scoticum* were found to be plentiful. There were also a few *Æschnas*, of which males of *Æ. juncea* and *Æ. grandis* were captured; the former settled on the front of my coat and was there netted. Judging by size *Æ. mixta* appeared to be present also.

Mr. K. J. Morton is able to record that a female *Hemianax ephippiger* was found in Ireland (*vide* E. M. M. Jan. 1914) in October, 1913. This is, of course, an accidental occurrence, as

was that of the female of the same species which was taken flying in a street in Devonport on February 24th, 1903.\*

On November 16th the Black Pond was again visited to see if *S. striolatum* was still on the wing. The latest date on which I had previously seen it was November 14th in 1897, and as the autumn was mild there was a chance of a later date being recorded. None were seen, however; but it is quite possible that they were not over, for the weather was not altogether favourable.

Some very interesting notes have come to hand concerning this, which is perhaps the commonest of English dragonflies. Miss D. Molesworth, of Brighton (*in litt.*, Oct. 21st, and again Nov. 6th, 1913), told me that she had had under inspection a number of *S. striolatum* from the deposition of the egg till the emergence of the imago, the whole life-cycle occupying less than a year. The female was caught ovipositing on September 18th, 1912, and, after being kept from water, was on September 20th held over it, when she gave more eggs. These hatched between October 21st and 25th. The nymphs did not grow at a uniform rate, and the wing-cases appeared on the largest towards the end of April, 1913. By June, four of the nymphs had reached a length of 16 mm. and then became restless. There were plenty of water-weeds in the aquarium, but they did not attempt to climb, though earlier in the year many "demoiselles" had scaled the water-plantain leaves and successfully emerged. Miss Molesworth then had to leave them for three weeks and on her return all four were dead. Meanwhile, others had reached the same stage; but as each attained a length of 16 mm. it died. In August a bank was made in one corner of the aquarium, reaching above water-level, and strips of wood about two feet long were inserted in it. In September the nymphs began one by one to climb to various heights—some to the top, some less than six inches. The first emerged on September 4th and the last on October 12th, 1913. Before the last had emerged, the boards were removed and a bank was built round the water-plantain stems. The nymph climbed and the imago emerged quite happily. That the earlier ones were ready to emerge was clear, for they partially did so under water. The female, from which the eggs were obtained, was depositing them in water not more than six inches deep, and the nymphs were kept in water of about that depth. In water of greater depth they left the bottom and began to crawl on the weeds. In 1913 another female deposited eggs on August 26th, and the first nymphs emerged on September 14th, less than three weeks later, but *they* were kept in a warm room! The largest nymph was 4 mm. long on October 21st; it was observed demolishing a smaller companion.

\* Figured, natural size, in 'Entomologist,' xxxvii. pl. 3.



It should be stated that the aquarium in which the 1912 nymphs were bred was standing on a brick window-sill, where the window was open day and night all through the winter. The weather being mild the water did not freeze, though it did in former years. In fact a nymph of a larger species was on one occasion frozen in the middle of a solid piece of ice and remained so for two days. When the thaw came it revived and seemed none the worse. These nymphs were not forced, therefore, by unusual heat, but probably were by receiving an unnatural amount of food. As soon as they began to eat *Chironomus* larvæ, they were fed almost daily and when nearly full-grown would sometimes eat as many as eight in succession, though each was as long as the nymph itself. Probably in confinement space has something to do with the rate of growth. For a few kept in a very small bottle with abundance of food scarcely grew at all, and when they were moved into a larger aquarium, where food must have been more difficult to procure, because less plentiful, they were found to be scarcely more than half the size of some which had already been there for six weeks. All emerged in the early morning, usually on dull days. One nymph showed a particular aversion to sunshine. Being ready to emerge, it crawled out of the water on a cloudy morning. When on the wood the sun came out rather suddenly, and the nymph immediately scrambled and fell down. As soon as the sun disappeared it climbed up again; but on the sun's reappearance it repeated its previous performance. It did this three times, and the nymph was not contented till the aquarium was shaded, when it emerged none the worse for what had happened.

Miss Molesworth's interesting notes may suitably be supplemented by a description\* and figure (Plate II.) of a full-grown nymph of *S. striolatum*, which I have therefore prepared:—

DESCRIPTION.—General colour sepia, from very pale to quite dark. *Length*, including anal appendages, about 18 mm.; greatest *breadth*, about 7 mm. *Head* of moderate size; in outline a flattened pentagon; width about 5.5 mm. *Antennæ* of seven segments, the basal two short and rather swollen, the rest more slender, with a ringed appearance. *Mask* (labium) tapering backwards to the middle hinge where it is narrow; this hinge almost as far back as the insertion of the midlegs; extremity spoon-shaped, covering the face; *palpi* broad, where they approach one another and there serrated; teeth reddish; *movable hooks*, long, sharp, slender; centre of labium produced in an obtuse angle; on this lobe, internally, are two semicircles of long reddish hairs, about fourteen in each, the lateral margin of each palpus fringed with a similar row of hairs, pointing inwards. Several pale marks in front of *vertex*, which also has pale markings. *Eyes*

\* A figure of *S. vulgatum* (= *striolatum*) in W. H. Nunny's paper, 'Science Gossip,' July, 1894, does not appear to represent a *Sympetrum* at all, and is certainly not *S. striolatum*.



prominent, somewhat hemispherical, situated at the fore-corners of the head. *Occiput* rather broad, rough, bearing some long hairs. *Top of head* as a whole slightly convex. *Prothorax* collar-like, a dark patch in centre, hind-margin convex. *Mesothoracic spiracles* dark, very conspicuous. *Meso-* and *metanotum* variegated with lighter and darker tints. *Legs* long, slender, joints darker; femora and fore- and mid-tibiæ ringed with darker sepia bands; fore- and mid-tibiæ hairy, hind tibiæ rather spiny; fore-legs about 10 mm. long, mid-legs about 11 mm., hind-legs nearly 16 mm. *Wing-cases* about 5 mm. long. *Abdomen* broad and somewhat flattened; with pale, long, slender, recurved mid-dorsal spines on segments six, seven and eight, and a small one on five hidden by the wing-cases; a pair of lateral spines on eight and nine, those on eight being of moderate length, those on nine conspicuously long, equal in length to the last two segments; two or four dark dots on the dorsal part of several of the hinder segments; also lines of paler or darker suffusions on the dorsal surface, which vary considerably according to the depth of colouring of the specimens; ventral surface of nymph-skin fairly uniform in colouring. *Anal appendages* short, hairy; *upper*, triangular, pointed; *laterals*, shorter and more slender; *lower*, more than half as long again as upper, and flat when looked at from the side. It is somewhat difficult to describe the hairiness of a dried nymph-skin, consequently it has been little referred to.

[*Material*.—(i.) A nymph-skin from which a male imago emerged on July 28th, 1903; (ii.) a skin of a nymph, taken in Richmond Park, Surrey, from which a male was bred on July 10th, 1903; (iii.) other nymph-skins found under such conditions as to admit no doubt of their identity. Nos. i. and ii. were the specimens chiefly employed. The figure is enlarged a little over four times.]

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## THE EARLIER STAGES OF *COLIAS HECLA*.

BY W. G. SHELDON, F.E.S.

So far as I am aware, the only lepidopterist who has written anything on the earlier stages of this beautiful Arctic species is Staudinger, and his brief note is in one important respect inaccurate.

Staudinger, who passed the summer of 1860 in the north of Norway, during his sojourn there met with *Colias hecla* abundantly, near Bossekop, in the Alten Fjord. He states: "the headquarters of this species was a flat sandy peninsula in the bed of the River Alten"; in this place "*Phaca lapponica*, De Candolle, the undoubted food-plant, grew very abundantly, and I noticed the females ova-depositing thereon."

The *Phaca lapponica* of De Candolle is, according to the 'Conspectus Floræ Europæ' of Nyman, now known as *Oxytropis lapponica*, a plant which, so far as I know, does not occur at Bossekop; at any rate, I carefully examined the headquarters of

*C. hecla* described by Staudinger, during my stay there in 1912, and the only leguminous plant I could find in the district was the *Astragalus alpinus* of Linné, which the 'Index Kewensis' states is the *Phaca astragalina* of De Candolle, and which grew freely, locally.

Later on, at Laxelv, in the Porsanger Fjord, as noted in 'Entomologist,' xlv. p. 339, I found *C. hecla* in great numbers, flying over flat rough meadows and fields in which *A. alpinus* grew abundantly; this plant is undoubtedly its food-plant there, and almost certainly, for the above reasons, at Bossekop also.

I do not, of course, know in how many localities in Lapland—a great part of which is entirely unexplored—*C. hecla* is found, and if it is always associated with *A. alpinus*, but it is certainly a very local species, found only in the above-mentioned localities of those I have explored, although it is stated to occur also on the north side of the Tornea Traske in Swedish Lapland. In all of these localities *A. alpinus* is an abundant plant; but it is so local that I do not recollect ever seeing a specimen elsewhere, though I have explored a great many miles of suitable country in Arctic Scandinavia.

The only other leguminous plant I could find in the Porsanger Fjord was what I think was a species of *Vicia*, which in the latter part of July had beautiful trusses of mauve flowers, and which grew about one foot high, and was plentiful along the shores of the Fjord at Kistrand. This plant the larvæ of *C. hecla* refused to feed upon. They also refused white and red clover, which I offered to them on my journey home, and which grew freely at Tromsø and at various places touched at south of that town.

It seems probable that the larvæ of the two exclusively Arctic species of *Colias* occurring in Europe—*C. hecla* and *C. verdandi*—feed *exclusively* in nature on *A. alpinus*. It should, however, be noted that *C. hecla* does not occur on the south side of the Tornea Traske, where *A. alpinus* is an abundant plant, and where *C. verdandi* flies in great numbers.

The ova of *C. hecla* were to be found plentifully at Laxelv at the time of my visit, July 11th to July 16th, 1912, almost every individual food-plant examined having some attached to it; they are deposited singly.

The ova is of the usual *Colias* type, upright, the vertical and horizontal diameters are 1.25 mm. and 0.65 mm. respectively. It has vertical ribs, about twenty-six in number; the distance they are apart is .05 mm.; numerous very shallow transverse ribs connect the vertical ribs. The diameter of the apex of the ova is .15 mm. The micropylar area consists of a number of shallow cells; it is not noticeably depressed. The surface of the ova is shining and opalescent. The larva emerges from the side.

The ova from which the foregoing description was made was deposited by a captive female on a plant of *A. alpinus*, on July 12th; it was then creamy white in colour; on the 13th it had changed to light red, and on the 14th to bright coral-red; on the 20th it was leaden coloured. The larva emerged on the 22nd. It thus appears that the period of the ova stage is ten days.

It will be seen, on reference to my description of the ova of *Colias werdandi* in 'Entomologist' xliv. p. 122, that the ova of these two species are identical in size and in all other respects, except that in *C. werdandi* the colour changes to deep orange instead of to coral-red, which the ova of *C. hecla* does. The period of this stage is in the case of *C. werdandi* two days longer.

Immediately after emergence the larva was 1.50 mm. long. The head was black, the remainder of the segments were dull green, transparent and thickly studded with tubercles, each tubercle having in its centre a spine. The larva at this stage eats holes in the upper cuticle of a leaflet of its food-plant, and rests stretched out at full length on the midrib thereof; it changed into the second stage on July 27th, and was then 2 mm. long and stout in proportion to its length. Colour dull green, very spiny, head greenish brown, spiny and shining, the remainder of the segments had a dark medio-dorsal stripe, lighter subdorsal area bounded below by darker stripes. The spiracular stripes are lighter than the remainder of the surface of the larva.

The change to the third stage took place on August 22nd. The larva was then 4 mm. long; head light amber-coloured; dorsal area dull dark green; subdorsal areas light green of the same tint, bordered on the lower edges with dark stripes of the same tint as the dorsal area. The spiracular stripes were of lighter green, the ventral area was of the same tint as the subdorsal. All the segments were thickly covered with black tubercles, each one of which emitted a black spine. The spiracles were light green with black circumferences. On August 29th the larva was slowly feeding; on September 6th it ceased feeding altogether, and was placed in a cool cellar in a flower-pot which contained dry sand and *Sphagnum*.

My stock of ova when I left Laxelv on July 16th was twenty-two, but by the time I reached England, on August 3rd, they had been reduced to half a dozen more or less unhealthy larvæ. *A. alpinus* is a most difficult plant to transplant or to keep fresh and healthy when it is dug up, and all my plants were yellow and unhealthy on arrival at home. Of these half dozen larvæ only two reached the hibernating stage, and one of these two died soon after being placed in winter quarters, reducing my stock early in October to a single specimen.

This larva remained quiescent and stretched out on the *Sphagnum*.

I had intended, upon the first sign of frost appearing, to



take it out of doors, so that it might get some approach to its natural home conditions in winter, and afterwards to force it, but the winter turned out to be exceptionally mild, and by January 23th, there not having been any frost, I brought the larva up and placed it in a warm room. I did not have a plant of *A. alpinus* in leaf, and so offered the larva young leaves of *Colutea arborescens*, which I had ascertained the previous summer it would eat. On January 22nd it commenced to feed upon these, and fed very slowly for several weeks, so slowly, however, that its daily meal, which was usually taken when the sun was shining, did not exceed a notch in a leaflet the size of an average pin's head. In the beginning of March it sickened and died. During the time it was feeding in the winter the size only increased a very little, not more than a millimeter in length. In all probability, to successfully rear this larva would entail its being kept at a temperature below freezing point for several months.

In its natural habitat the snow would probably be gone by the middle of May. Staudinger mentions that at Bossekop the first male was taken on June 18th, 1860, but it certainly was not out there on the day I left, June 22nd, 1912. On my arrival at Laxelv on July 11th, fully one-third of the specimens flying about were more or less worn. The season was rather a late one, and I should say that June 20th, as the first date of emergence on an average season, is probably not far wrong.

*Astragalus alpinus* in Lapland entirely loses all trace of foliage in the winter, and until the middle of June, or rather later, it does not develop sufficient new leaves to feed the larva upon; this being the case, there seem to be three possible theories of its behaviour after hibernation:—

(1) That it has an alternative food-plant. I do not think this probable for, as before stated, I could not find another leguminous plant in its haunts, and one cannot imagine it feeding upon anything else.

(2) That it feeds upon the roots of *A. alpinus*. This is possible, for this plant has long succulent roots, very much after the style of *Lotus corniculatus*.

(3) That it feeds very slowly through the summer on the leaves of *A. alpinus*, hibernating a second time, either as a full-fed larva or as a pupa. I am inclined to think that this latter theory will prove the correct one. The larva I had in confinement seemed perfectly healthy and satisfied with its daily minute meal for weeks, which is just what one would expect it to do in a state of nature if this theory be correct, for the leaves until the middle of June are very minute and would not suffice to satisfy a more vigorous appetite. But, of course, my larva had not been subjected to its natural low winter temperature for many months, and one does not know what effect the unusual treatment received might have had upon its appetite.

Youlgreave, South Croydon: January 13th, 1914.



*DIADIPLOSIS COCCIDIVORA*, N. SP.

BY E. PORTER FELT.

THE small midges described below were reared in some numbers from a species of *Pseudococcus* by A. Rutherford, Government Entomologist of the Department of Agriculture, Peradeniya, Ceylon, and forwarded for identification under the date of November 27th, 1913. This species appears to be congeneric with *D. cocci*, Felt, a species reared earlier by Mr. William H. Patterson from larvæ preying upon the eggs of black scale, *Saissetia nigra*, in St. Vincent, West Indies. The two species are quite different, and further studies may result in their being referred to different genera.

♂. Length 1 mm. Antennæ probably half longer than the body, presumably thickly haired, fuscous yellowish; fourteen segments, the fifth binodose, the two portions of the stem each with a length approximately a quarter greater than the diameter, the distal enlargement with a length a quarter greater than its diameter, and bearing two moderately stout circumfili. Palpi: the first segment small, globose; the second with a length nearly three times its diameter; the third a little longer, more slender. Mesonotum dark yellowish brown, the submedian lines, scutellum and postscutellum fuscous yellowish. Abdomen fuscous yellowish. Wings hyaline, the third vein uniting with costa at the apex of the wing, the fifth joining the posterior margin at the distal fourth, its branch at the basal third. Halteres and legs a nearly uniform fuscous yellowish, tarsi probably somewhat darker; claws moderately stout, strongly curved, the anterior and mid unidentate, the posterior simple, the pulvilli about half the length of the claws. Genitalia: basal clasp segment moderately short, stout; terminal clasp segment short, stout, with a rather large, strongly curved apical spur; dorsal plate long, deeply and triangularly emarginate, the lobes narrowly rounded and sparsely setose; ventral plate moderately long, tapering to a narrowly rounded setose apex. Harpes foliate, tapering to a narrowly rounded apex, laterally with a thick patch of long, stout setæ; style long, slender, slightly curved.

♀. Length 1.5 mm. Antennæ probably nearly as long as the body, sparsely haired, dark brown; fourteen subsessile segments, the fifth with a stem one-sixth the length of the cylindric basal enlargement, which latter has a length about thrice its diameter. Palpi: the first segment subglobose, the second with a length more than three times its diameter, the third half longer than the second, and more slender. Mesonotum dark yellowish brown. Abdomen yellowish orange. Ovipositor short, the terminal lobes narrowly oval and sparsely setose, otherwise nearly as in the male.

Type Cecid a2486.

State Museum, Albany, N.Y.

# DESCRIPTION OF A NEW CICADA FROM WEST AFRICA.

By W. L. DISTANT.

## *Musoda gigantea*, sp. nov.

♂. Head and pronotum pale testaceous, the latter with the fissures darker, and the lateral and posterior margins ochraceous; eyes greyish-white; mesonotum dark ochraceous with darker mottlings and four obconical spots at anterior margin, the two central spots largest; abdomen castaneous, the posterior segmental margins, a narrow central longitudinal fascia, and the anal area more or less pale ochraceous; body beneath pale ochraceous, the face and legs darker and more pale testaceous; tegmina and wings hyaline, venation, costal membrane to tegmina, and narrow basal suffusion to wings pale testaceous; head with the front conically prominent, anteriorly more darkly transversely striate; vertex narrowly longitudinally incised between the ocelli; face short, broad and convex, a short, broad, central sulcation on its anterior area, its lateral areas strongly transversely striate; rostrum reaching the intermediate coxæ; opercula not passing base of abdomen, obliquely directed inwardly, their apices rounded and widely separated; anterior femora shortly and finely toothed beneath on apical areas; pronotum somewhat broadly, centrally, longitudinally sulcate, the fissures profound; abdomen broad, robust, above strongly, centrally ridged, the lateral areas oblique, basal segment strongly, centrally, conically produced, beneath obliquely depressed towards apex.

Long. excl. tegm. ♂, 29 millim. Exp. tegm. 88 millim.

*Hab.* West Africa; Cameroons (Conradt). British Museum.  
This is the second but larger species of the genus yet described.

## A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 60.)

### (vi) *Basses-Alpes.* (b) *Larche.*

To speak of Larche as "unexplored" is less inappropriate, perhaps, than would appear in view of the recorded visits made in past years by French entomologists. Donzel, in the "forties," collected hereabouts; but he seems not to have published the results of his expedition as minutely as he has recorded the lepidopterous fauna of Digne and the lower Basses-Alpes. It is to Antoine Guillemot, to Bellier de la Chavignerie, and to Berce that we owe the first detailed accounts of the numerous Lepidoptera met with at this point of the Italian frontier; and after

the lapse of fifty-eight years it may be agreeable to those interested in the butterflies of a little-known corner of the Alps to retrace the footsteps of these pioneers.

The published account of their experiences given by Guillemot is rare. It is to be found neither in the library of the Natural History Museum, South Kensington, nor of the Entomological Society of London; and it is only within the last month, and after this paper was printed, that I saw a copy included among the *separata* of a foreign bookseller. I am indebted, therefore, to the kindness of M. Charles Oberthür for a loan of the work.\*

As far as I can see, Larche has changed little in appearance since Guillemot and Bellier were there in 1855, from July 29th to August 3rd. The hotel accommodation is decidedly worse, for while they speak of comfortable quarters and good plain food, I am afraid I cannot endorse their recommendation of the inn I visited. However, I was lucky enough to find my bedroom occupied when I came up from Barcelonnette on the morning of the 25th, and by the courtesy and kindness of the Commandant of the garrison, whom I chanced to meet in the road, I was enabled to obtain excellent quarters with M. Mathieu, the local butcher—quarters usually filled by officers of the Alpine regiments on the march and on manœuvres. Both Monsieur and Madame were extremely kind and attentive, and I cordially advise any of my readers who may fancy a week or two at Larche to do as I did—put up in their chalet, lay in a good supply of tinned foods, biscuits, &c., for lunch in the open, and which are for sale at the small grocer's shop in the village; and after the *premier déjeuner* of coffee and rolls, return to the auberge only to dine.

In one respect, it is true, Larche has changed. Many of the enterprising inhabitants having amassed fortunes, especially in Mexico, have come back to build large stucco villas and live in their native place, for the summer months at any rate. It is possible, therefore, that with the steady increase of motor traffic into Italy by this route, one of these proud proprietors may devise a scheme for the reception of boarders, though the summer at this altitude—5568 ft.—is short: eight weeks at the most.

I did not know, when I decided to finish my entomological tour at Larche, that M. Oberthür's two collectors from Digne had passed the previous season (1912) there. Nor had I the report of their experiences to guide me, as partly recorded in recent published fascicules of '*Lépidoptérologie Comparée*' (Rennes, 1913, fasc. vii., '*Observations sur les Syrichthus du*

\* '*Vingt-Cinq Jours de Chasses aux Lépidoptères à Barcelonnette, et à Larche*,' par A. Guillemot. Clermont. 1856. *Cp.*, also, '*Observations sur les Lépidoptères des Basses-Alpes*,' par Bellier de la Chavignerie, *Ann. Soc. Ent. France*, 1854, p. 29, 1856, p. 5, and 1859, p. 177.



groupe d'Alveus'). Also, I had no intention when I left England of visiting the Basses-Alpes at all, but had planned to turn west from Le Vercors (*vide antea*, p. 8) into Ardèche. I had not provided myself, therefore, with Bellier's notes, which might have assisted me to the right localities, though a chance meeting at Barcelonnette with Mr. E. A. Tucker and Mr. Charles Morris, of Cannes—both ardent lepidopterists—gave me the clue to a locality in which, as I subsequently discovered, these French naturalists made their most important captures.

The journey from Barcelonnette is advertised in summer to be performed by motor omnibus. As a matter of fact, when the motor reached Condamine—the half-way house—the driver was seized with a sudden spasm of economy for petrol; and another and altogether "ancient piece" was trundled out of the coach-house to perform the last long uphill climb. After the dizzy ordeal of the day before on the Col d'Allos the change was delightful; and as we jogged peacefully along the road it was possible to survey the splendid scenery and to note chance insects on the wayside flowers. But for the greater part of the journey, the forest gradually disappearing and the flora of the valley giving place to the veritable mountain kind, there was little on the wing, as the sun was still hidden behind the ever-rising barrier of the hills.

When the room difficulty had been settled, I set off for the Lauzanier valley, the road diverging from that to Italy, and crossing by pastures to the left bank of the Ubayette. The first butterfly to attract attention was a remarkably fine brood of *I. lathonia*, just emerged and in perfect condition, with males of *Epinephele lycaon* flitting *mæra*-like over and about the stone walls of the cornfields. On past the bridge, females of *A. damon* were in some profusion, with *P. argyrognomon*, *C. virgaureæ*—all males—some worn *C. hippothoë*, var. *eurybia* females, and a fair sprinkling of Argynnids—*aglaia*, and *niobe*, var. *eris* (very rarely typical). The season was, however, getting late for the mountain meadows; and I quite agree with Bellier, who recommends a visit to Larche before they are cut, as with the hay goes much of the best collecting. Down by the stream I could see some small Parnassidæ swinging lazily over the *Sedum* beds; and these subsequently proved to be *Parnassius delius*, rather worn. The steep grassy banks on the left-hand side of the mule path were full of butterflies, chiefly of the commoner alpine sorts; conspicuous by their numbers and exquisite condition being *Canonympha iphis*, while occasional Black-and-White Skippers on the track itself were either *Hesperia carthami*, *H. alveus*, or *Pyrgus sao*. Unfortunately, upon the whole length of the green valley, which ends with a steep climb to the Refuge hut, vast herds of sheep, goats, and horses had been grazing; and it was



here also that for half an hour I sat and watched the strapping Chasseurs Alpins of the French Army defile before me—fresh, merry, and brisk as are all these mountain infantrymen, even with eight hours' march behind them over these stark mountains. The little herbage left by the shepherds' flocks the army mules seemed to have finished up; and for quite an hour's walking I encountered practically nothing of note—a few scattered *Colias phicomone*, a very occasional *Erebia epiphron*, var. *casiope*, and rarer *Polyommatus pheretes*; even *Plebeius argus*, the ubiquitous, had diminished, and, of course, as soon as I attained a "not bad eminence," in went the sun, down came the mist, and collecting butterflies in the Lauzanier was over for the day, though it was barely one o'clock. So after lunch and a welcome foot-washing in the torrent (strongly recommended for weary and sore feet), I turned back, seeing nothing more on the wing until just past the opposite hamlet of Maison-Méane, where the last rays of a belated sun woke into momentary activity a few fine male *E. goante*.

Next day being gloriously fine, I set out for the Lac de la Madeleine, which lies on the Italian side of the Col de Larche (6545 ft.), a few hundred yards across the frontier, and about an hour and a half's easy walking from Larche itself. Quite the commonest insect about was *Macroglossum stellatarum*, and wherever the sun touched the little patches of sainfoin and lucerne, *Colias edusa* and *C. hyale* were chasing one another, with *P. apollo* and the usual common Pierids. But I did not come across *P. napi*, var. *bryoniæ*; and I think that, this being a single-brooded species in the Alps, it was probably over. Pushing on, I did not unfurl until I had reached the "International House," where the red-white-and-blue and the red-white-and-green posts upon the roadside denote the meeting of France and Italy. The Italian Dogana is somewhat further on by the Lake, and the affable Customs officer in command, who regarded my net as an excellent piece of fooling, not being able to direct me to any mountain path which would bring me back into the Lauzanier, I missed no doubt the best collecting ground hereabouts. For example, I failed entirely to hit the right spot for *C. palæno*, which I suspect occurs only on the Italian slopes, for nowhere could I discover the indispensable *Vaccinium*, upon which, in common with *P. optilete*, the larva feeds.

Within a few yards of the Lake itself, however, I did come across a, to me, new and exceptionally interesting form of *Erebia mnestra*, this being the variety named by Bellier *gorgophone*, and described by him as a distinct species (Ann. Soc. France, 1863, pp. 419-420), intermediate between *E. gorge* of the Alps and *E. gorgone* of the Pyrenees, but later determined as a localized form of *mnestra*. This variety is apparently so little

known to British collectors that I think it is worth while to reproduce in brief Bellier's account of it.

"Male, rusty brown; all four wings traversed as to two-thirds of their breadth by a ferruginous band which mingles somewhat with the ground colour, especially on the hind wings.

"Up. s. f. ws.—Band with two black white-pupilled eyes (sometimes absent); h. ws. without ocellation.

"Un. s. f. ws. lighter and more reddish brown, reproducing the pattern of the upper side. H. ws. reddish grey, with a broad median band of dark brown slightly lunulate; a marginal band of the same colour. Fringes unicolorous on both sides.

"Female larger than male, from which it hardly differs on the upper side, except that the brown is more yellowish and the ferruginous band clearer. Un. s. h. ws. much clearer grey, with two bands of reddish brown, on which the nervures show somewhat whitish. Fringes of all the wings plain and unicolorous on both sides.

"Differs from *gorge* by the wings being more rounded, and the fringes simple, not barred. Ground colour of the under side duller in tint; band thicker, less festooned, and showing less distinctly from the ground colour."

In male specimens sent by Dr. Verity, of Florence, to the Natural History Museum from the Italian Maritime Alps, the blackish-brown androconia are very strongly marked. Bellier also notes that it prefers the green pastures like *epiphron* to the *gorge*-haunted rocks; and this is my experience, also, of the species.

I may add that the plate in the 'Annales' by no means does justice to the rich coloration of the var. *gorgophone*, except that of the figure of the under side of the male; and it is to be hoped that in some future number of his beautiful 'Lépidoptérologie Comparée,' M. Charles Oberthür will find a place for male and female figures of this very striking form of *mnestra*—if such it be. Curiously enough, Mr. H. J. Elwes, in his 'Revision of the Genus *Erebia*' (Trans. Ent. Soc. London, 1898, pp. 169–207), makes no mention of it either under *mnestra* or *gorge*. Of the *mnestra* group, in his previous 'Notes on the Genus *Erebia*' (*loc. cit.* 1889, p. 333), he merely remarks that "little need be said, as they are species little subject to variation and of limited distribution." Of the Pyrenean *E. gorgone*, with which Bellier associated it, Dr. Chapman says (*loc. cit.* 1898, p. 222), "if it is a variety of anything, it is a variety of *mnestra*." But he, too, in his exhaustive examination of the male appendages of the genus, does not appear to have had any material to work out the affinities of the Basses-Alpes *gorgophone*.

(To be continued.)

THE GENUS *PÆCILOPSIS* (HARRISON).

BY J. W. H. HARRISON, B.Sc.

## Part I.—PRELIMINARY REMARKS.

As I have pointed out elsewhere, the "genus" *Biston*, as represented in Staudinger's 'Catalogue,' is a very heterogeneous collection, comprising elements from no fewer than six distinct genera. These are:—

*Biston* (Leach); type *stratarius*.

*Lycia* (Hüb.); type *hirtaria*.

*Ithysia* (Hüb.); type *zonaria*.

*Pæcilopsis* (Harrison); type *pomonaria*.

*Apocheima* (H. S.); type *hispidaria*.

*Microbiston* (Stgr.); type *lanarius* (Ev.) (= *tartaricus* (Stgr.)).

It was originally my intention to take these genera in turn, and to deal with each of the species in all its stages in detail. The imagines of the genus *Ithysia* have already been discussed, and the treatment of the other forms postponed in order to give time for the completion of the life-histories of *Ithysia græcaria*, *I. alpina*, and *I. italica*, but it has been found impossible to rear (even in a hothouse) these exclusively Southern forms. In the meantime, however, I am glad to say that I have been able to secure, and describe at length, the early stages of all of the species in the genus *Pæcilopsis*, and therefore propose to complete my work in that section now. This genus was described in *Lepid. Comp. fasc. vii. p. 344*, and I have but little to add to the description given there, except that one very important observation has been made which justifies further my separation of these species from *Ithysia*. This is the fact that, whilst the chromosome number in *Ithysia* is 112, in *Pæcilopsis* it is 56, and in *Lycia* 28.

It has become imperative that I should take up this genus now, because I have discovered in the course of my studies that the Central European form that passes for *P. lapponaria* is not that insect at all, although, fortunately, our Scotch insect is so. Not only is this true, but, in addition, the two forms fall into two different sections of the genus, which contains four species forming two closely allied groups of two. These groups are:—

The two species *Pæcilopsis lapponaria* and *P. rachelæ*.

The two species *P. pomonaria* and *P. isabellæ*.

The first group is probably Northern in its origin, for *P. lapponaria* ranges from Lapland to Livonia, and then reappears in Scotland; whilst *P. rachelæ* is widely distributed in America, from Montana and Manitoba along the Mackenzie Valley to Alaska. The other group is of Central European origin, *pomonaria* having its headquarters in North Central Germany, but extending, although sparsely, to Eastern France, Scandinavia,



and Austria. The other species is of more limited distribution, for it is confined to the Silesian Mountains and to the Alps of Switzerland, Bavaria and the Tyrol.

It will be seen that I have been compelled to erect a new species for the so-called *lapponaria* from the Alps and Silesia. I have tried hard to avoid this necessary split, and to persuade myself that the form is but a mountain form of *pomonaria*, but it will not do; there are differences of specific value at every stage of its existence—differences greater in many instances than those occurring in the case of two obviously distinct species like *L. hirtaria* and *P. pomonaria* at corresponding points. In fact, had one been so inclined, it would have been perfectly feasible to break this genus on larval differences, such as has been done in other groups, and then find this separation justified by imaginal characters. In such a case *lapponaria* would fall into one subgenus whilst *isabellæ* would fall into the other!

After these preliminary remarks, I had intended to take the species in detail, but I think it better to give a brief description of the Central European form *isabellæ*, and then contrast it, in all the salient points, with its nearest ally *pomonaria*, on the one hand, and on the other with *lapponaria*, with which it has been so long lumped. There would be no gain in comparing it with *rachele*, for that insect, although perfectly distinct, is sufficiently close to *lapponaria* to obviate any such comparison.

*Pæcilopsis isabellæ*, sp. n. (= *lapponaria*, auct. part.).

*Male*.—Tone of whole insect much blacker than its congeners. Fore wings subhyaline, with the ground area before the second line feebly provided with silvery white scales. First, second and median lines present, undecided, but fairly broad; median and second lines tending to fuse toward the lower margin; second line followed by feeble white line. A zigzag subterminal line intersects the more or less dark terminal band. Veins, especially those of the cell, black; costal groove black, mixed with orange-yellow scales. Fore wings fairly long, *rounded* at the tip. Hind wings hyaline, except for a few white scales at the base. Fringes narrow, black. Antennæ black, not pectinated to the apex. Head reddish, collar white, thorax and abdomen black, with fairly broad red median stripe; patagia outlined in white. Genitalia, tip of valve rounded.

*Female*.—Wings rudimentary, but longer than those of the other three species, provided with longish, stiff grey hairs. Body black, sprinkled everywhere, like the wings, with orange-red scales, only concentrated to form a median line on the thorax; a few scattered white scales may be present also; the whole provided with long rather coarse hair. Antennæ thick, heavily grey scaled, feebly pectinated when freshly emerged.

Types, one male and one female from Innsbruck, Tyrol.

A table giving the points of difference between this species and *P. pomonaria* and *P. lapponaria* is appended.



		<i>Pomonaria.</i>	<i>Isabellæ.</i>	<i>Lapponaria.</i>
	OVUM .....	Small translucent	Fairly large; glaucous green, more opaque	As in <i>pomonaria</i>
LARVA.	Young larva..	Black, with white spots and bars	Greenish; no spots, &c.	As in <i>pomonaria</i> , but with more white spots on spiracular stripe
	Second instar	Usual form of genus	Green; striped to mimic larch needles	As in <i>pomonaria</i>
	Full-grown ..	Short, stout; pattern decided; texture coarse; colour yellowish	Pattern nearly the same as in <i>pomonaria</i> . Ground purplish.	Longer; skin texture fine; stripes degraded as in <i>zonaria</i>
	Food.....	Oak — most forest trees	Larch—refuses other foods	Birch, <i>Erica</i> , <i>Myrica gale</i> , many trees and shrubs
	PUPA .....	Red brown, rather polished	Yellower brown	As in <i>pomonaria</i> —shorter
MALE IMAGO.	Antennæ ....	Tip clear	Tip clear	Pectinations indicated at tip
	Collar .....	Broad white	Narrow white	Black
	Thorax.....	Pattern as in description of <i>isabellæ</i> , but coarser, and colours less decided; whole much paler	Pattern as described. Red median stripe and white outlines of patagia very clear	Much broader. No pattern, medio dorsal red stripe clear; fur paler laterally
	Fore wings ..	Long—tip rounded	As in <i>pomonaria</i>	Shorter and broader; tip angular
	Fringes ....	White; black spots at ends of veins; fairly broad	Narrow; black	Broad; silky dark fuscous, like <i>zonaria</i>
	Valves of genitalia .....	Tip rounded, as in <i>hirtaria</i>	As in <i>pomonaria</i> , but narrower	Tip with definite angle as in <i>zonaria</i>
FEMALE IMAGO.	Antennæ ....	Rather thin; black	Thick; pale	Thin; black
	Thorax and abdomen ..	Colour black, irregularly speckled with rusty scales. Hairs short pale	Scales redder, similarly scattered. Few pale scales. Hairs much longer and paler	Red scales definitely massed in a broad median stripe down both thorax & abdomen; hairs pale short
	Wings .....	Rudimentary, very short, with rusty scales and few pale hairs	Much longer; scales redder, but some almost white scales present. Hairs much longer	Variable in size, but never so long as in <i>isabellæ</i> . Hairs darker and shorter
	Whole outline of insect	Long	As in <i>pomonaria</i>	Shorter and rounder

## THE PSOCIDÆ OF NOTTINGHAMSHIRE.

BY J. W. CARR, M.A., F.L.S., F.G.S.

WHILE collecting Hemiptera during the last two summers a good many Psocids were obtained, and as no members of this family have hitherto been recorded for Nottinghamshire, a list of the species captured may be of some use as a contribution to our knowledge of the distribution in Britain of these delicate and interesting little insects. I am indebted to Mr. Kenneth J. Morton for his kindness in examining and identifying all my captures.

*Amphigerontia variegata*, Latr.—Common on trunk of sycamore tree in my garden at Sherwood, Nottingham; Thorney; both in August, 1913.

*A. fasciata*, Fab.—Near Edwinstowe, Sherwood Forest, June 12th, 1912.

*A. bifasciata*, Latr.—On hawthorn hedge, and commonly on trunk of sycamore in garden, Sherwood, Nottingham, July 17th to August 10th, 1913; swept from *Calluna* near Edwinstowe, Sherwood Forest, September 25th, 1913.

*Psocus nebulosus*, Steph., and *P. longicornis*, Fab.—Thorney, August 15th–19th, 1913 (L. A. Carr).

*Stenopsocus immaculatus*, Steph.—Aspley Woods, near Nottingham; The Dumbles, Kirkby-in-Ashfield; Upton, near Southwell, on hawthorn; Normanton-on-the-Wolds and Plumtree, on *Salix*; Thorney; taken from June 28th to September 3rd, 1913. Taken also by F. M. Robinson in Bulcote Wood, October 16th, 1913.

*Graphopsocus cruciatus*, L.—Common. Aspley and Beauvale Woods, July, 1912; Fiskerton; Kingston Park; West Leake Hills; North Collingham; Widmerpool; Sherwood Forest, near Edwinstowe:—all in 1913 between July 25th and September 25th. Also taken by F. M. Robinson in Lambley Dumbles and at Papplewick, October 3rd–9th, 1913.

*Mesopsocus unipunctatus*, Müll.—Aspley Woods, near Nottingham; Sherwood Forest, near Edwinstowe: both June, 1912. Radcliffe-on-Trent; The Dumbles, Kirkby-in-Ashfield; Upton, near Southwell; Sherwood, Nottingham, June 21st to August 13th, 1913.

*Philotarsus flaviceps*, Steph.—West Leake Hills, August 21st, 1913.

*Elipsocus westwoodi*, McLach.—On trunk of sycamore tree in my garden, Sherwood, Nottingham; Arnold, near Nottingham; Upton, near Southwell; Widmerpool, on *Corylus*; Sherwood Forest, near Edwinstowe. Taken from July 12th to September 25th, 1913.

*E. abietis*, Kolbe.—Edwinstowe, Sherwood Forest, June, 1912; Fiskerton, on oak; Arnold, on oak; Epperstone Park, on *Pteris* and on *Castanea*; Kingston Park, on *Salix*; North Collingham, on *Salix*; Thorney. All July to September, 1913.

*E. cyanops*, Rost.—Arnold, near Nottingham, July 24th, 1913; North Collingham, on hawthorn, August 25th, 1913.

*Pterodella pedicularia*, L.—Nottingham, common on windows and tables in my study, August 15th to 30th, 1913; also noticed, less commonly, throughout September.

*Ectopsocus briggsi*, McLach.—Widmerpool, on oak, August 18th, 1913.

*Cæcilius flavidus*, Steph.—West Leake Hills, abundant on oak, ash, and beech, August 10th, 1912, August 15th–21st, 1913; East Leake, August 11th, 1912; Edwinstowe, Sherwood Forest, August 30th, 1912; Thorney, August, 1913; Widmerpool, on oak, birch, and *Salix*, August 18th, 1913; North Collingham, on ash, August 25th, 1913.

*C. burmeisteri*, Brauer.—Thorney, August 15th–19th, 1913 (L. A. Carr).

*Hyperetes questfalicus*, Kolbe.—Among papers in room at University College, Nottingham, December 13th, 1912.

*Troctes divinatorius*, Müll.—Also among papers in same room as last species, February 10th, 1913.

## SYMPETRUM MERIDIONALE, SELYS, AND OTHER ODONATA.

BY C. W. BRACKEN, B.A., F.E.S.

A FEW cases of insects formerly belonging to the veteran entomologist, Mr. G. C. Bignell, of Saltash, near Plymouth, came into my possession after his death. Among them was a store-box of Neuroptera (*sensu lato*), collected by the Rev. T. A. Marshall, of Botus-Fleming, Cornwall, who died in 1903. On going through this recently I found a *Sympetrum* labelled *vulgatum*, Swanage, no date. As there were no *striolatum* in the box, I concluded that Marshall either intended it for the latter species, using the older name, or that he had really taken *vulgatum*, a rare occurrence. I sent the insect to Mr. W. J. Lucas, who is of opinion that it is neither *vulgatum* nor *striolatum* but *meridionale*. If so, the specimen is of considerable interest, since Mr. Lucas, in his 'British Dragonflies,' says: "The claim of this insect to a position on the British list rests on two females of old date." Most of Marshall's specimens were Corsican, but there were several others from Swanage, including some fine *Orthetrum cancellatum*. It may be worth mentioning that one of the Corsican *O. cærulescens* has the left anterior wing much abbreviated. The right wing is 28 mm. long, the left only 20 mm., the pterostigma being about the same distance from the body on each side.

Plymouth.

CONTINENTAL INSECTS OF VARIOUS ORDERS  
TAKEN BY DR. T. A. CHAPMAN IN 1913.

BY W. J. LUCAS, B.A., F.E.S.



Pupa-skin of *Ascalaphus cocejus*. Magnification a little over  $2\frac{1}{2}$  nat. size.

One antenna could not be withdrawn, and it is shown broken, or bitten off. The pupal-jaws are well seen; and it must be borne in mind that they were worked by the imaginal jaws that were not then withdrawn from them. The pupal-skin is very ethereal, as can easily be seen. The head has become detached from the body.

AFTER each of two entomological excursions to the Continent in 1913, Dr. Chapman was kind enough to give me a small collection of insects, which he was able to take, belonging to the less-known Natural Orders. In April, May, and June, he visited the Rhone valley in Switzerland and the district of the Italian Lakes, and this first collection contained insects from Sierre (1760 ft.) in the Rhone valley, from Locarno (680 ft.) on Lago Maggiore in Switzerland, and from Pallanza (680 ft.), also on Lago Maggiore, but in Italy.

In July and August the scene of operations was transferred to France, and the second collection contained insects from Lautaret (6790 ft.) and Bourg d'Oisans (2360 ft.) in Dauphiné. The former is a well-known botanical and entomological locality, and the latter is in the valley of the Rimauche, on the way up to Lautaret.

My thanks are due to Mr. K. J. Morton for naming a number of the specimens.

FIRST COLLECTION.

**Plecoptera.**

*Nemoura marginata*. Locarno, April.

*N. cinerea*. Locarno, April.



- \**N. lateralis*. Locarno, April.  
*N. variegata*. Pallanza, May 19th–26th.

### Odonata (=Paraneuroptera).

*Libellula quadrimaculata*. Two males and three females in more or less teneral condition; Locarno, April. One male possessed strongly developed nodal spots and longitudinal saffron suffusion, but was otherwise normal; the others were of the var. *prænubila*, some being of a more pronounced type than the others.

- \**Orthetrum brunneum*. One male; Sierre, May 27th–June 2nd.  
*Cordulia aenea*. One female; Sierre, May 27th–June 2nd.  
*Æschna isosceles*. One male; Sierre, May 27th–June 2nd.  
*Pyrrhosoma nymphula*. One female; Sierre, May 27th–June 2nd.  
*Ischnura elegans*. One male; Locarno, April; one male; Sierre, May 27th–June 2nd.  
*Enallagma cyathigerum*. Two males; Sierre, May 27th–June 2nd.

### Neuroptera.

- \**Ascalaphus coccajus*. Four males; Sierre, May 27th–June 2nd. One of these was accompanied by the very delicate pupa-skin. In emerging it appears that one antenna stuck fast in its case (figure). It is well-developed but is broken off, the knob and part of the shank remaining in the case. Dr. Chapman thinks this is not an isolated occurrence, and that the insect, when confronted with the difficulty, itself bites off the antenna.  
*Sialis lutaria*. Three; Locarno, April.  
*Raphidia notata*. One female; Sierre, May 27th–June 2nd.  
*Chrysopa perla*. One; Locarno, April.

### Trichoptera.

- \**Plitocolepus granulatus*. Two; Locarno, April.  
 \**Philopotamus ludificatus*. One; Locarno, April; one; Pallanza, May 19th–26th.

## SECOND COLLECTION.

### Orthoptera.

- Omocestus rufipes*. One; Bourg d'Oisans, August 6th–21st.

### Plecoptera.

- Nemoura inconspicua*. Two females; Lautaret, July 22nd–August 5th.  
*N. variegata*. One male; Lautaret, July 22nd–August 5th.

### Odonata (=Paraneuroptera).

- Æschna juncea*. One female; Lautaret, July 22nd–August 5th.  
*Sympetrum vulgatum*. Four males and three females; Bourg d'Oisans, August 6th–21st. Most of these were teneral in condition to a greater or less degree, and pale in colour.

**Neuroptera.**

*Hemerobius quadrifasciatus*. One; Lautaret, July 22nd–August 5th.

*Chrysopa vulgaris*. Two; Lautaret, July 22nd–August 5th.

*Panorpa germanica*. One female; Bourg d'Oisans, August 6th–21st.

**Trichoptera.**

*Stenophylax latipennis*. One; Bourg d'Oisans, August 6th–21st.

\**S. uenorum*. One male and two females; Lautaret, July 22nd–August 5th.

\**Metanæa chapmani*. Three males and one female; Lautaret, July 22nd–August 5th. This is a new species, and has been described by Mr. K. J. Morton (*antea*, p. 49), where details of structure are figured.

*Apatania fimbriata*. One male; Lautaret, July 22nd–August 5th.

\**Sericostoma pedemontanum*. One female; Lautaret, July 22nd–August 5th.

*Beræa pullata*. One male; Lautaret, July 22nd–August 5th.

\**Rhyacophila albardana*. One male and one female; Lautaret, July 22nd–August 5th.

The species marked with an asterisk (\*) do not belong to the British fauna.

Kingston-on-Thames: February, 1914.

## NOTES ON THE METAMORPHOSIS OF *PHASGONURA VIRIDISSIMA*, L. [ORTHOPTERA.]

BY ANDREW B. LUVONI.

ON June 22nd of last year a female nymph of this species was obtained while sweeping some long grass in a field at Westcliff, Essex. Judging by its development after subsequent moults, it would appear to have been at about the second or third moult when captured, the ovipositor being about 3 mm. long, and the wings barely noticeable. It was placed in a cage together with an assortment of plants likely to be found in its natural haunts; such as various species of grass, dandelion, knapweed, bindweed, and one or two kinds of buttercup. The following day it was found to have been feeding freely on the common creeping buttercup (*Ranunculus repens*), an operation it apparently performed at night or in the early morning, as I never succeeded in observing it in the act. On visiting the locality later, from which this specimen was obtained, I found the above-mentioned plant growing in profusion, and, therefore, it seems highly probable that this is its food-plant in a state of nature. On June 25th it moulted, the ovipositor then measuring

6 mm., and the wings 3 mm. The next moult occurred on July 10th, the dimensions increasing to—ovipositor 15 mm., wings 9 mm., and total length 34 mm. The antennæ, which were damaged and of unequal length before, became normal after the second moult. It greatly appreciated being placed in the sun, leaning over on one side and extending the long jumping legs to expose as much of its body as possible. These sun-baths appeared necessary after each moult to enable it to acquire firmness and proper coloration, an operation extending over a period of about two days. For three days before a moult the nymph ceased to feed, and became sluggish and whitish in colour, somewhat after the style of a snake before sloughing its skin.

The empty nymph skin was always eaten immediately after being cast, this employing the insect about an hour and a half, the skin of the large hind legs being eaten last. The final moult took place on July 31st at about 6.30 a.m. The imago, after eating the empty skin, clung for some time to the grass stems to allow the wings to unfold and attain their proper development. This specimen when taken in the hand would bite fiercely with the mandibles, occasionally retaining its hold until set at liberty.

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## ADDITIONS TO THE LIST OF KENT APHIDIDÆ.

By FRED. V. THEOBALD, M.A., F.E.S., Hon. F.R.H.S., &c.

DURING the past two years I have found or identified from material previously collected the following Aphides, so far not recorded from Kent, and some of which are new to the British fauna. Several new species of *Macrosiphum* have been described since the previous list, and these are also included here.

The year 1913 was noticeable for three things: first, the comparative paucity of the species of Aphides to be found, secondly, the presence of numbers of sexuparæ in the autumn months, and thirdly, the vast numbers of three or four species. Most abundant and harmful of all has been *Aphis sorbi*, which did untold damage to the apple crop; next in importance has been *A. abietina*, Walker, which has been most harmful to the Sitka and Norway spruces in Ireland and parts of the South of England, in many cases causing complete defoliation. This is one of the species which breeds entirely viviparously, no sexuparæ having been found, whilst parthenogenetic females occur right through the winter. So far no sexuparæ have been found of *A. gossypii*, Glover, the so-called Cotton Aphis, which is recorded here for the first time in Britain. Only once have I

found oviparous females, also of the Woolly Aphis (*Eriosoma lanigera*, Hausmann), and as far as recent experiments go that I have carried out, there does not appear to be any migration between the elm and the apple in this country, as has been shown to occur in America by Miss Edith Patch. Moreover, I have had one badly attacked apple tree netted for some three years, and no alatæ whatever have appeared. Reproduction without sexuparæ in some species may evidently occur for a long time. The list given here does not include any fresh localities for the Aphides of Kent so far recorded (*vide* 'Entomologist,' January, 1911, pp. 16-21, and November, 1911, and January, 1912), only new species found in the county.

### Genus MACROSIPHUM, Passerini.

*Macrosiphum taraxaci*, Kalténbach.—On dandelion (*Leontodon taraxacum*). Wye, June 17th, 1911, and July 20th, 1912; Blean Wood, July 7th, 1912.

*M. duffieldii*, Theobald.—On tulips, March 27th, 1913. Maidstone, many alatæ and apteræ of this beautifully marked species brought me by Mr. Adrian Duffield and others sent by Mr. Bunyard.

*M. primulæ*, Theobald.—On cultivated primulas and on the wild primrose in gardens. Maidstone, March 27th, 1913; Stouting, near Hythe, April 28th, 1913 (A. Duffield); Wye, June 26th, 1913.

*M. betæ*, Theobald.—On mangolds, beetroots, sugar beet, and several wild *Chenopodiaceæ*. Herne Bay, July 4th, 1911; Wye, July 2nd-14th, 1911; Faversham, July 4th, 1911; Dover, July 4th, 1911; Bromley, July 2nd, 1911, and Thanet generally; Tonbridge, July 26th, 1913.

*M. arundinis*, Theobald.—On *Arundo phragmitis*. Wye, August, 1912; Romney Marsh, July 17th, 1913, in small colonies.

*M. graminis*, Theobald.—On meadow foxtail and Timothy grasses; Wye, August 23th, 1911, evidently very uncommon.

*M. rubiellum*, Theobald.—On bramble (*Rubus fruticosus*) and raspberry (*R. idæus*), May to June. Wye, Ashford, Paddock Wood, Tonbridge, Maidstone, Ramsgate, abundant.

*M. malvæ*, Mosley.—On *Malva sylvestris* and *Malva*, sp.? Wye, June 7th, 1913, two alate females.

*M. trifolii*, Theobald.—On *Trifolium procumbens*. Wye, August, 1912, in small numbers.

*M. loti*, Theobald.—On *Lotus corniculatus*. Wye, July and August, 1912 and 1913. Alatæ and apteræ in the last year.

*M. stellaris*, Theobald.—On *Stellaria*, spp. Wye, May, 1912. I found this species in vast numbers in alate form at Bramley, in Surrey, in May, 1913. This was erroneously placed under Schrank's name (Entom. December, 1911).



*M. cratægarium*, Walker.—On hawthorn. Wye, June 7th, 1911, and July 1st, 1911.

*M. sileneum*, Theobald.—On *Silene inflata*. Wye, July 10th, 1911, and August 14th, 1912. A few isolated specimens.

*M. aquilegiæ*, Theobald.—On cultivated columbines. Stouting, near Hythe, April 28th, 1913. Collected by Mr. Adrian Duffield; Wye, March 24th, 1912, and June 17th, 1912.

*M. veronicæ*, Theobald.—On *Veronica beccabunga*. Wye, May 22nd, 1912.

*M. longipennis*, Buckton.—On water grass. Romney Marsh, June, 1910.

*M. diplanteræ*, Koch.—On *Malva*, sp.? Wye, June 9th, 1911.

### Genus APHIS, Linnæus.

*Aphis galii*, Koch.—On bedstraw (*Galium*, sp.?). Wye, June 7th, 1913; Crundale, June 14th, 1913; Folkestone, June 27th, 1913, alatæ and apteræ in dense clusters.

*A. beccabungæ*, Koch.—On *Veronica beccabunga*. Wye, June 19th, 1911. A few apteræ and one alate female scattered about on the flower stalks and leaves.

*A. polygoni*, V. d. Goot.—On *Polygonum*, sp.? Wye, July 20th, 1911. A single alate female, with a few lice.

*A. petasitidis*, Buckton.—On *Tussilago petasites*. Herne Bay, July 14th, 1911. I took two alate females of this species, but have failed to find it since then.

*A. nasturtii*, Kaltenbach.—On watercress. Wye, July 20th, 1911; August 7th, 1912, and July 7th, 1913, on the flower heads; numerous apteræ in 1913, but only two alatæ.

*A. padi*, Reaumur.—On bird cherry, Bearstead, October 18th, 1913. Large numbers of sexuparæ sent me by Mr. E. E. Green. The oviparous females were depositing their ova on the leaves, and continued to do so until the end of the month; the ova remain firmly attached to the leaves which fall. Males also present.

*A. ranunculi*, Kaltenbach.—On dandelion roots, with ants in attendance. Wye, October 22nd, 1911.

*A. gossypii*, Glover.—On cucumbers under glass, and on marrows in the open. Wye, June 7th, 1913, and July 8th, 1913. I have also received this aphid from other localities in England. It is commonly known as the Cotton and Melon Aphid, and does much harm to that crop in America, Africa, &c. It is now well known in Russia, and is probably one of the world-wide species.

### Genus MYZUS, Passerini.

*Myzus rosarum*, Kaltenbach.—On roses. Wye, May 10th, 1912.

*M. pyri*, Koch.—On pears. Wye, September 7th, 1913. I

found the oviparous females laying their ova firmly fixed to the leaves in my garden, but could not find a male.

*M. whitei*, Theobald.—On currants, Beltring, Paddock Wood, July 13th, 1912. Alatæ only.

#### Genus RHOPALOSIPHUM, Koch.

*Rhopalosiphum staphyleæ*, Koch.—On *Malva* sp.? Wye, June 7th, 1913. One alate female.

*R. loniceræ*, Siebold.—On *Lapsana communis*. Wye, July 4th, 1913.

#### Genus SIPHOCORYNE, Passerini.

*Siphocoryne pastinacæ*, Koch.—On various Umbelliferae, with *S. capræ*. Wye, July 4th, 1911; Faversham, August 2nd, 1912.

*S. farniculi*.—On fennel. Abundant at Sevenoaks in June, 1912 and 1913; smothering the plants.

#### Genus PHORODON, Passerini.

*Phorodon inulæ*, Passerini.—On *Inula dysenterica*. Wye, October 18th, 1913. The oviparous females laying their ova firmly fixed on the leaves, and a few on *Potentilla acerina*.

#### Genus HYALOPTERUS, Koch.

*Hyalopterus melanocephalus*, Buckton.—On *Silene inflata*. Whitstable, July 23rd, 1913.

#### Genus LACHNUS, Illiger.

*Lachnus* (*Eulachnus*) *agilis*, Kalténbach.—On *Pinus sylvestris*. Wye, May 20th, 1913.

*L.* (*Lachniella*) *juniperi signata*, Del Guercio.—On junipers. Wye Downs, June, 1913. Collected by Mr. Duffield; many alatae.

#### Genus CHAITOPHORUS, Koch.

*Chaitophorus coriaceus*, Koch.—On sycamore. Wye, May 14th, 1913.

*C. populus*, Linnæus.—On poplars. Wye, July 21st, 1913.

#### Genus VACUNA, Heyden.

*Vacuna betulæ*, Kalténbach.—On birch. The Warren, Ashford, June 12th, 1913; and Wye, June 22nd, 1913. Buckton's *Thelaxes betulina* from Guestling is only this species.

#### Genus BRYSOCRYPTA, Haliday.

*Brysocrypta bumeliæ*, Schrank.—On ash. Wye, July 3rd, 1912; a few apteræ on leaf petioles.

## Genus TRAMA, Heyden.

*Trama radicis*, Kaltenbach.—On roots of artichokes with ants. Wye, December 14th, 1913. Masses of apteræ and nymphæ, one, a late female, hatched on February 7th, 1914.

In addition to these species new to Kent, I may mention that *Rhopalosiphum nymphææ*, Linnæus, occurred in quantity on *Alisma* at Wye in July, 1911, and July, 1913, and also at Norwich in 1912; and *Melanoxantharium salicis*, Linnæus, in 1913 near the ponds on Romney Marsh. I have also found the large *Lachnus piceæ*, Walker, on one spruce in large numbers at Tunbridge Wells, and these suddenly disappeared when alata, as in previous years when I have found this species.

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## NOTES AND OBSERVATIONS.

PRIONUS CORIARIUS IN EPPING FOREST.—The past season seems to have been very favourable for this beetle, as I captured three fine specimens during the last week in July. Two of these were males, and they were found resting upon the boles of a very large oak tree; at the base of the trunk were a few holes, three of these being in the earth, out of which the insects must have emerged, as it is well known that the larvæ feed within the underground roots. The female, which is very large, was taken at some arc lamps, and is the second one I have taken this way. Although this insect is so large, it is fairly inconspicuous during the day when at rest upon trees, as it seems to have a good protective resemblance. My personal experience of the insect seems to point to its increase of late years in the Forest, as I have taken seven during the last three years—four males and three females.—H. E. HUNT; 255, Chingford Road, Walthamstow, Essex.

DELAYED EMERGENCE OF SATURNIA PAVONIA (CARPINI).—From a few ova, received from a friend at the New Forest, I reared a few larvæ of this species, sixteen in all, during the summer of 1912; all of these spun up as usual, but only four imagines emerged last April—three males and one female. The rest of the pupæ are laying over and are quite healthy, and I hope to get the moths out during the coming season.—H. E. HUNT; 255, Chingford Road, Walthamstow, Essex, January 30th, 1914.

NOTES ON "COURTSHIP" OF GOMPHOCERUS MACULATUS (ORTHOPTERA) AT CRAIGTON, LINLITHGOWSHIRE.—On August 8th, 1913, many *G. maculatus* were stridulating. Hearing one individual emitting an occasional single note in addition to the ordinary "song," I approached cautiously, and witnessed the following little incident. A male and female *G. maculatus* were settled side by side in close proximity, the female almost motionless, and the male

stridulating at intervals, for the most part in a very low tone, only just audible at the distance of a few inches. Every now and then he made a single abrupt movement of the thighs, thus causing the short, single note which had first attracted my attention; this sound was usually made by only one leg. For some minutes the two maintained their relative positions, only altered slightly by small movements of the male. Occasionally the latter extended his low call into the full normal song. Apparently attracted by the last a second male soon came hurrying up, pausing once or twice to call by the way. On his approach the first male moved aside somewhat, later commencing to feed. Number two settled face to face with the female, and uttered the soft call as the other had done. The female now began to show symptoms of boredom, and, cutting off a long stem of grass with her mandibles, proceeded leisurely to munch it up. When finished, she walked slowly off, and was not followed by either male, although number two raised his voice to a louder pitch as the female increased her distance, as if in the vain hope of arresting her attention. A few yards further on the female was accosted by a third and more excitable male, and a repetition of the previous scene took place. For nearly three-quarters of an hour the male did his utmost to please his prospective partner, singing his soft song almost incessantly, and frequently swaying his body from side to side in a most curious manner. The relative positions of the two varied, the male being sometimes face to face with the other, but as frequently by her side. He was always cautious not to approach too closely, as, when he seemed too pressing in his attentions, the female moved abruptly off, although otherwise quiescent. At considerable intervals of time the male broke into the loud song, always prefixing it by the short single note. The incident was at length terminated by the female suddenly leaping off to some distance, leaving the disconsolate male alone. Truly courtship in *G. maculatus* requires patience!—S. E. BROCK; Kirkliston, Linlithgowshire, January, 1914.

PYRAMEIS ATALANTA IN FEBRUARY.—When walking along the edge of Ironshill enclosure this morning I was rather surprised to see a butterfly which, flying past me, settled on the sandy bank of the enclosure. A nearer approach proved it to be *Pyrameis atalanta*. I watched the insect for some little time at a distance of a couple of yards or so, and left it still basking in the bright sunshine.—G. LYLE; Brockenhurst, February 1st, 1914.

GLOUCESTERSHIRE LIST OF LEPIDOPTERA.—On looking through Hudd's 'List of Lepidoptera of the Bristol District,' I find no mention of *Epunda tutulenta* in Gloucestershire. I captured three at sugar here in Pucklechurch in September, 1908. I do not know if this is a new record, as Hudd's list is a little out of date.—B. A. CONEY; Pucklechurch, Gloucestershire, February 12th, 1914.

ABRAXAS GROSSULARIATA IN DECEMBER.—On December 14th, 1913, I took a freshly emerged *Abraxas grossulariata* at rest on



a wall in Eastbourne. It was not near a greenhouse.—S. A. CHARLES; 170, Mayfield Place, Eastbourne.

ABRAXAS GROSSULARIATA IN DECEMBER.—I have to record the capture of a specimen of *Abraxas grossulariata*, as it was flying through the arches of Ravenscourt Park Station on December 4th, 1913, about 4 p.m. It was a good specimen, not crippled in any way, and rather a large one. It was flying perhaps a trifle weakly, but strongly enough to fly out of reach the moment I let it go. I regret now that I did not keep the specimen.—C. W. WHALL; 19, Shaftesbury Road, Ravenscourt Park, W.

[A second brood of this species was recorded in 1903 (Entom. xxxvi. pp. 289, 318).—ED.]

LEPIDOPTERA OF THE ISLE OF SKYE.—As I propose to visit the Isle of Skye next July, I should be glad to know what one might expect to meet with in the way of moths and butterflies during the month in that locality.—(Major) R. B. ROBERTSON; Hillingbury Cottage, Chandler's Ford, Hants.

RETARDED EMERGENCE OF PARAGE EGERIA.—At the end of last June I took a female *P. egeria* and she laid a few eggs, which hatched in due course and fed up with the exception of four or five, which seemed as if they were going to die. I, however, placed them in another pot with grass, and they fed slowly, pupating at the end of October and in November, one at a time. I now have four pupæ, two look as if they were on the point of emergence, nearly black, and two still quite green; this being about three months in pupa state. It looks as if they were waiting for the spring before emerging. Has it ever been noted that this insect in a wild state passes the winter in the pupal state? Imagines from the larvæ which fed up began emerging on September 11th.—(Major) R. B. ROBERTSON; Chandler's Ford, Hants, February 6th, 1914.

ORRHODIA ERYTHROCEPHALA ab. GLABRA AT EASTBOURNE.—On November 30th *O. erythrocephala* ab. *glabra* came to sugar in a wood in this neighbourhood. This, I believe, is the first recorded capture in Sussex since the early seventies. Although a steady rain was falling, quite a number of insects visited my patches. I sugared on several evenings during the first fortnight of December, but with no further success.—EDWIN P. SHARP.

HEMIMENE (DICHRORAMPHA) TANACETI (HERBOSANA) NOT IN GLOUCESTERSHIRE.—Referring to my note (Entom. xlv. p. 101) I find that the specimens therein recorded must be referred to the second brood of *Hemimene (Dichrorampha) acuminatana*, and that we cannot yet claim *herbosana* as a Gloucestershire insect.—C. GRANVILLE CLUTTERBUCK, F.E.S.; 23, Heathville Road, Gloucester, January 16th, 1914.

PLEBEIUS (LYCÆNA) MEDON (ASTRACHE) IN DOVEDALE.—With further reference to the occurrence of this insect in Dovedale noted

by Dr. St. John (Entom. xlv. p. 314) last year, and by Mr. G. T. Bethune-Baker (p. 39 in your last issue) in July, 1908, we used to take it there frequently thirty years ago, and I have heard of it several times since. The Derbyshire limestone seems to produce some pretty female examples of *Lycana icarus*, for I found a very fine race on difficult ground in the Via Gellia on June 5th, 1911, and the only female captured was very beautiful. *Ino (Adscita) geryon* was taken at the same time.—G. HANSON SALE; Littleover House, Littleover, Derby.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, December 3rd, 1913.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Mr. Walter Ormiston, of Kalupahani, Haldumille, Ceylon, was elected a Fellow of the Society.—Dr. G. B. Longstaff presented to the Society, on behalf of a number of subscribers, a copy of Hübner's 'Exotische Schmetterlinge,' original edition.—Mr. G. T. Porritt exhibited two curious specimens of *Abraxas grossulariata*.—Miss Diana R. Wilson, who was present as a visitor, butterflies caught in Brazil this year, during the last week of January and the first week of February.—Prof. Poulton, eight examples of *Episcaphula interrupta*, Lac., found in one clay cell, and eleven examples found in another, by Mr. C. O. Farquharson, B.Sc., at Moor Plantation, near Ibadan, S. Nigeria. He also read notes received from Mr. Lamborn, on the Driver Ants (*Dorylus*) of Southern Nigeria, and exhibited the material referred to.—Dr. K. Jordan, a series of species of the two groups of Papilios called by Haase *Cosmodesmus* and *Pharmacophagus* respectively.—Mr. Champion, a specimen of *Thorictus parciseta*, Wasm., attached to the scape of the left antenna of a worker of an ant, *Myrmecocystus viaticus*, F.—Mr. W. C. Crawley, (1) Three dealated females of *L. niger*, L., taken Isle of Wight, July, 1911; these, after rearing workers, fought until only one survived. (2) A female of *Aphenogaster subterranea*, Latr., taken August, 1912, at Yvorne with Prof. Forel, after marriage-flight, brought up two workers by September, 1913. (3) Six females of *L. flavus*, Fabr., taken after marriage-flight at Seaton, July 14th, 1912. They built a cell together and brought up workers, by June 23rd, 1913.—Mr. O. E. Janson, specimens of *Laglusia caloptera*, Bigot, one of the curious forms of Diptera with stalked eyes, from Dutch New Guinea.—Capt. E. B. Purefoy, two more specimens of *Gonepteryx cleopatra* with gynandromorphous colouring.—Mr. E. B. Ashby, a number of Nearctic butterflies.—Mr. W. J. Kaye, a very large series of specimens of *Heliconius anderida*, ranging into a number of forms which tended to become fairly definite subspecies in different geographical regions.—Dr. H. Eltringham gave a preliminary account of the scent apparatus in *Amauris egialea*, comparing the same with that of *A. niavius*, illustrated by drawings, and microphotographs of sections of the brush.—The following paper was read: "New Species of South

American Butterflies," by W. F. H. Rosenberg, F.E.S., and G. Talbot, F.E.S. Mr. Talbot made exhibits in connection with this paper.

Wednesday, January 21st, 1914.—*Annual Meeting*.—Mr. G. T. Bethune-Baker, F.Z.S., F.L.S., President, in the chair.—No other names having been received in addition to those proposed by the Council as Officers and Council for the ensuing year, the latter were declared by the President to be elected.—Mr. R. W. Lloyd, one of the Auditors, read the Auditors' Report, which was adopted on the motion of Mr. H. E. Page, seconded by Mr. J. Platt Barrett.—The Rev. G. Wheeler, one of the Secretaries, then read the Report of the Council, which was adopted on the motion of Mr. R. S. Standen, seconded by Mr. R. W. Lloyd.—The President then delivered an address, after which Prof. Poulton moved a vote of thanks to him, coupled with the request that he would allow the Address to be printed as a part of the Society's Proceedings; this was seconded by Mr. W. J. Lucas and carried by acclamation.—The President returned thanks and Mr. O. E. Janson then proposed a vote of thanks to the other officers for their services during the past year; this was seconded by Mr. T. F. P. Hoar and carried; the Treasurer and the two Secretaries returning thanks in a few words.—GEORGE WHEELER, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*December 12th, 1913*.—Mr. A. E. Tonge, President, in the chair.—Mr. Tatchell, of Bournemouth, was elected a member.—Mr. W. J. Kaye read a paper, "The Ithomiinæ," and illustrated it with a fine selection of examples of the different groups of the subfamily.—Mr. Hall reported a case of the occurrence of the "furniture mite," and asked how the pest could be effectively dealt with.—Mr. Step, a box of Diptera, chiefly Syrphidæ, taken at flowers of Michaelmas Daisy in October and December.—Mr. R. Adkin, a series of *Nemeophila plantaginis* bred from ova laid by a Grasmere female in July, 1912. One larva fed up and pupated in September, and the imago came out on Oct. 27th. The rest hibernated several together in the *débris* of the cage, and emerged in due course the following June.—He also showed four *Mellinia ocellaris*, presented to the Society by Mr. H. Worsley-Wood.—Mr. Curwen, a series of *Erebia ceto* near the form *ab. obscura* from the Simplon Pass.—Mr. Carr, a collection of Lepidoptera from Staffordshire and N. Wales, including very strongly marked forms of *Acidalia marginepunctata*, and some nicely banded examples of *Melanippe tristata*.—Mr. Adkin read a Report of the Annual Conference of Delegates of Societies affiliated to the British Association.

January 8th, 1914.—Mr. W. J. Kaye, F.E.S., Vice-President, in the chair.—Messrs. D. A. Gotch, of Northampton; A. Leeds, of Knebworth; W. H. Jackson, of Wimbledon; and T. H. Archer, of Southfields, were elected members.—Mr. Hugh Main gave an interesting account of his holiday in Switzerland in 1913, entitled "The Brunig Road," and illustrated his address with a large number of lantern



slides, made mainly from his own photographs.—Mr. Step, a photograph by Mr. West (Ashtead), of the "furniture mite" *Glyciphagus cursor*.

January 22nd, 1914.—*Annual Meeting*.—Mr. A. E. Tonge, F.E.S., President, in the chair. — The Balance Sheet and Report of the Council were received and adopted, and the Officers and Council for the coming year were declared elected.—The President read his Annual Address, and after giving an account of the present status of the Society, dealt at considerable length with some phases of his special study of the ova of Lepidoptera, particularly wild-laid ova.—The usual votes of thanks were accorded, and the new President, Mr. B. H. Smith, took the chair.—Mr. Newman exhibited a small specimen of *Leucania pallens*, taken at sugar at Newark, with three well-developed antennæ, of which one was much thicker than usual, and towards the tip was bifid.—HY. J. TURNER, *Hon. Rep. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Annual Meeting of the Society held at the Royal Institution, Colquhoun Street, Liverpool, December 15th, 1913, the President, Mr. F. N. Pierce, in the chair.—Mr. John M. Wilding, 52a, Orrell Lane, Liverpool, was elected a member of the Society.—The following members were elected Officers and Council for next year, *viz.*:—President, R. Wilding; Vice-Presidents, F. N. Pierce, F.E.S., R. Newstead, F.R.S., M.Sc., J. R. le B. Tomlin, M.A., F.E.S., H. R. Sweeting, M.A.; Hon. Treasurer, J. Cotton; Librarian, F. N. Pierce; Hon. Secretary, Wm. Mansbridge, F.E.S.; Council, L. West, H. S. Leigh, F.E.S., A. E. Gibbs, F.L.S., F.E.S.; A. W. Boyd, M.A., F.E.S., C. E. Stott, P. F. Tinne, M.A., S. P. Doudney, Wm. Webster, R. S. Bagnall, F.L.S., F.E.S.—Mr. F. N. Pierce delivered the Presidential Address, taking for his subject "The Hairs and Scales of Lepidoptera." The President described in detail his original observations upon this branch of insect morphology, and illustrated the same by many drawings and microscopic preparations. In the course of his remarks he described a difference he had found between certain scales in *Tephrosia crepuscularia* and *biundularia* for exhibition, and stated that this was the only difference of a structural character he had been able to discover in these two species.—Mr. R. Wilding brought a specimen of *Eubolia bipunctaria* for exhibition, and stated that it was taken by himself so long ago as July, 1880, but he had never before recorded it. Captured at West Kirby, this is the second record of this unlikely moth for our two counties.—Dr. J. Cotton showed a number of colour photographs of Lepidoptera by the Paget process, and pointed out the advantages of these plates over the older processes.—WM. MANSBRIDGE, *Hon. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—Meetings held in the Manchester Museum.—October 1st, 1913.—The following exhibits were made:—Mr. R. Tait, Junr.: a long series of *Abraxas grossulariata* varieties bred during 1913, including var. *varleyata*; a fine series of the melanic variety of *Boarmia repandata* from Penmaen-mawr, bred in 1913; a series of *Geometra papilionaria* bred from



Delamere larvæ; *Agrotis lucerneæ*, bred from Penmaenmawr; *Cucullia chamomilleæ*, bred from Devonshire larvæ, and *Aplecta nebulosa* var. *robsoni* bred from Delamere larvæ, 1913.—Mr. W. P. Stocks: a large number of species, including *Lycæna argus* (= *ægon*), *Drepana falcataria*, *Anarta myrtilli*, and *Aspilates strigillaria* from Delamere; *Lobophora viretata*, *Ligdia adustata*, *Diaphora mendica*, *Asthena candidata*, *Leucania lithargyria*, *Tephrosia bistortata*, *Euclidia mi*, *Mamestra dentina*, *Eupithecia sobrinata*, *Numeria pulveraria*, &c., from Silverdale; *Semiothisa liturata*, *Acronycta menyanthidis*, &c., from Witherslack.—Mr. W. Buckley: a series of *Agrotis ashworthii* from N. Wales, including one that resembled *A. lucerneæ* superficially, and an asymmetrical example; a series of *Dianthæcia conspersa* from N. Wales. These had been two years in pupa and included two dark forms.—Mr. L. Nathan: *Lasiocampa quercus* from Ainsdale larvæ; *Phragmatobia fuliginosa* bred from the Isle of Man, &c.—Mr. V. Coryton: A large number of species taken and bred in Cheshire in 1913, including *Acronycta leporina*, *Tethea subtusa*, *Eupithecia fraxinata*, *E. absinthiata*, *Chesias spartiata*, &c., and a number of Micro-Lepidoptera.—Mr. J. H. Watson: a new *Philosamia* hybrid—*P. pryeri*, male, × *P. cynthia advena*, female, this being the reverse cross to the one named *pryadvena* in the Trans. Manch. Ent. Soc. 1912. Also *Parnassius apollo apollo* ex Gothland Is. and *P. apollo scandinavica* for comparison; also *P. apollo alpheraki* f. *magnifica* of Xsienschopolski.—Mr. J. E. Cope showed the following Coleoptera: Boll weevil from the Mississippi delta, 1913; *Anobium domesticum* from Ashton-under-Lyne, Lancs, July, 1913; *Atomaria atricapilla* from Ashton Moss, August, 1913; *Psammæchus* sp.—a foreign species caught on bananas; *Prionus* sp. from Toronto, Canada, August, 1912.

November 5th, 1913.—The following exhibits were made:—Mr. W. Mansbridge: a series of *Nyssia zonaria*, showing variation, from Crosby, Lancashire; bred series of *Ematurga atomaria*, showing black forms, both male and female, *Mamestra glauca* and *Coremia ferrugata* from Burnley; *Cænonympha typhon* and *Lycæna astrarche* (approaching var. *artaxerxes*) from Witherslack; *Parasemia plantaginis* from the South of England; *Boarmia repandata* from Delamere, the Liverpool district and Portsmouth.—Mr. B. H. Crabtree: a series from Hertfordshire of *Lycæna corydon*, female, var. *semi-syngrapha*, some females having very light under sides, and others having the pair of wings on one side smaller than those on the other side; a short series of under side varieties of *Lycæna bellargus* from Folkestone; very light yellow forms of *Ematurga atomaria* from Wansford; two under side varieties of *Lycæna astrarche* var. *artaxerxes*, with very few markings, from Aberdeen; a short series of very yellow forms of *Spilosoma menthastræ* from Aberdeen, showing radiated markings; three varieties of *Melitæa aurinia* from Oban and County Clare.—Mr. C. F. Johnson: a long series of *Cænonympha typhon*, *Lycæna astrarche*, and *Acidalia fumata* from Witherslack; a long and varied series of *Aporophyla australis*, *Agrotis obelisca* and *Anchocelis lunosa*, and specimens of *Leucania vitellina* and *Triphæna subsequa*, all taken at Freshwater from September 7th to 16th, 1913.

—Mr. R. M. Pearce: *Lasiocampa quercus*, reared from ova to imagines on ivy in thirteen months, with ova, pupæ, and larvæ; bred *Lymantria dispar* with larvæ and pupæ; fourteen species of butterflies from Anglesea.—Mr. A. E. Wright: from Witherslack a number of species, including *Cyaniris argiolus*, *Lampropteryx suffumata*, *Triphosa dubitata*, *Eupithecia abbreviata*, *Eustroma silaceata*, *Tephrosia punctularia*, *Asthena candidata*, *Gnophos obscurata* (bred); from St. Anne's-on-Sea: a specimen of *Pernoptilota fluviala*, series of *Leucania littoralis*, *L. pallens* (red form), and *Miana literosa*, &c.; from Burnley: *Oporabia filigrammaria* and *Celæna harvorthii*.—Mr. R. Tait, Junr.; long series of *Agrotis agathina* bred from Delamere and N. Wales larvæ; *Noctua castanea* var. *neglecta* bred from Delamere larvæ; *Boarmia repandata* bred from Durham larvæ.—Mr. V. Coryton: *Chesias spartiata*, *Dilobia cæruleocephala* and *Oporabia dilutata* from Delamere; a dark var. of *Plusia gamma* from North Cheshire.—Mr. J. H. Watson: a new sub-species of *Antherea friti* from the Andaman Islands, named *insularis* by him; he also showed three new *Philosamia* hybrids: *Philosamia* hybr. *andrei* = *P. cynthia canningi*, male, × *P. cynthia advena*, female; *Philosamia* hybr. *lastoursi* = *P. cynthia advena*, male, × *P. cynthia canningi*, female; *Philosamia* hybr. *oberthürri* = *P. pryeri*, male, × *P. cynthia advena*, female; together with their parents.

December 3rd, 1913.—Mr. B. H. Crabtree exhibited and gave notes on *Abraxas grossulariata* var. *varleyata*. A *varleyata* female paired with a type male produced fifty-six types; from these he bred a second brood in September, October, and November, including a good number of var. *varleyata*, both male and female. Some of these were splendid forms, showing some little variation *inter se*.—Mr. Buckley read some further notes on *Acidalia contiguaria*. It appears that a dark female paired with a light male is sterile in the second generation.—Mr. W. Mansbridge showed series of *Thera variata* and *T. obeliscata*.—Mr. W. B. Lees, an example of *Heliothis peltigera*, taken in Platt Fields Park, Manchester, on June 1st, 1913, and a red *Leucania pallens*, from Northenden.—Mr. R. Tait, Jr., autumn Lepidoptera from Monkswood.—Mr. A. W. Boyd, a short series of *Tenio-campa gracilis* and a pair of *Geometra papilionaria*, from Rostherne, Cheshire; also a few *Aspillates strigillaria* and *Aplecta nebulosa* (both type and var. *robsoni*), and an example of *Acronycta menyantidis*, from Delamere.—Mr. J. H. Watson, a series of *Sagana zapatosa*, a Saturnid from Colombia, S. America, with cocoon and pupa; also the following forms of *Parnassius delius*:—ab. *herrichi*, *leonardi*, subsp. *styriaca*, from the Styrian Alps in Austria, and its ab. *confluens* (Hoff.).

January 7th, 1914.—Mr. J. H. Watson gave the Annual Presidential Address—"The History of our Entomological Science." He described the lives and works of many of the earliest zoologists and entomologists, and in many cases exhibited their original books. He surveyed entomological science from its origin to the present day.—Mr. J. E. R. Allen exhibited series of *Dianthæcia cæsia*, *D. cucubali*, and *D. capsophila*, from Donegal larvæ, and also *Abrostola tripartita* with var. *urticæ*, from Lancashire and Cheshire.

February 4th, 1914.—Mr. B. H. Crabtree showed three ichneumons bred from the larvæ of *Agrotis ashworthii*.—Mr. W. Mansbridge, a series of *Peronea hastiana*, selected from a large number bred from Ainsdale, on the Lancashire coast; these included vars. *divisana*, *mayrana*, *coronana*, *albistriana*, and unnamed melanic varieties.—Mr. H. Horsfall, two living larvæ taken in the open on February 1st: *Phragmatobia fuliginosa* and a small noctuid larva.—Mr. J. E. Cope, photographs of two Delamere localities and a few of the Coleoptera taken there: *Amara communis*, *Calathus melanocephalus*, *Byrrhus pilula*, *Chrysomela staphylea*, *Corymbites æneus*, *Barynotus schønherri*, *Apion violaceum*, and *A. ulicis*, *Phyllobius calcaratus* and *P. oblongus* from one locality; from birches in the other: *Athous hæmorrhoidalis*, *Dolopius marginatus*, *Clytus arietus*, *Deporans betule*, *Otiorrhynchus picipes*, *Strophosomus coryli* and *Phyllobius argentatus*.—The rest of the evening was occupied by a microscope exhibition. Several members brought microscopes and slides, and Mr. Buckley opened with a discussion on the methods of wet and dry mounting.—Mr. J. B. Garnett showed some remarkable Hymenoptera and Diptera.—A. W. BOYD, M.A., *Hon. Sec.*

## RECENT LITERATURE.

*Annals of Tropical Medicine and Parasitology*. Series T.M., vol. vii., Nos. 3B and 4, November 7th, 1913, and December 30th, 1913. Liverpool.

No. 3B contains nothing specially relating to Entomology. In No. 4, however, will be found:—(i) A paper on "Isle of Wight Disease," in connection with insects other than Hive-bees, by H. B. Fantham and Annie Porter; (ii) "Certain Mosquitos of the genera *Banksinella*, Theobald, and *Tæniorhynchus*, Arribalzaga," by H. F. Carter (well illustrated); (iii) "New Culicidæ from the Sudan," by F. V. Theobald; and (iv) "Parasite of *Stratimyia chameleon* and *S. potamida* (Diptera), with remarks on the biology of the hosts," by H. B. Fantham and Annie Porter.

W. J. L.

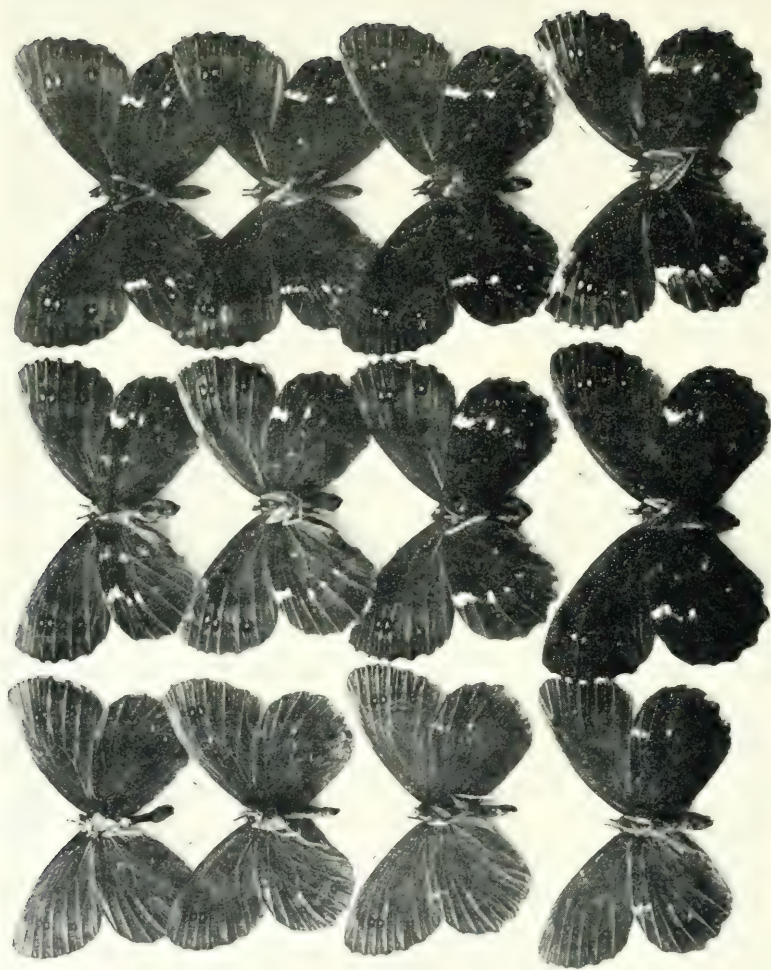
*The Forty-third Annual Report of the Entomological Society of Ontario for 1912*. Toronto. 1913.

THOUGH containing no paper of striking importance, the 144 pages of this Report (with a number of illustrations) are replete with useful and interesting information touching various sides of entomology.

W. J. L.







*EREBIA LIGEA*, var. *ADYTE*, Hb. TRANSITION TO TYPICAL *LIGEA*, L.  
 Left row: var. *adyte* (Lapland). Last of row parent of middle row. Middle row: Examples bred in Hamburg from Lapland  
 parent. Last of row equal in size to average Harz *ligea*. Right row: *ligea* from Harz. Last of row bred in Hamburg.

# THE ENTOMOLOGIST

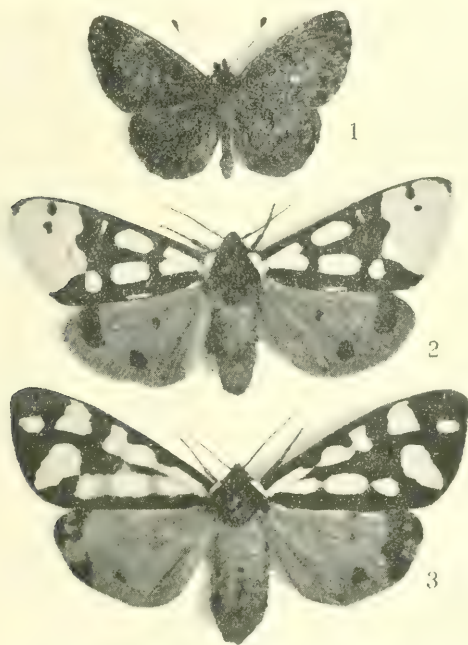
VOL. XLVII.]

APRIL, 1914.

[No. 611

## ABERRATIONS OF *ARGYNNIS SELENE* AND *ARCTIA VILICA*.

By GERVASE F. MATHEW, Paymaster-in-Chief R.N., F.L.S., F.E.S.



THE above figures have been photographed from varieties captured or bred in this neighbourhood. No. 1 is a peculiar variety of *A. selene*, which was taken on June 10th, 1910. Its chief feature is the remarkable shape of its wings, which are much shorter, broader, and more rounded than in typical examples, and which caused it to fly in a very striking manner;

so much so that when first seen I thought it was some queer Geometer, and was surprised, after I had netted it, to find out what it was. Unfortunately, the photograph is rather blurred, and does not show the markings very clearly. The submarginal rows of black spots on both wings are much larger than usual, and those of the hind wings reach the apex of the marginal black chevrons. The disc is paler and not so heavily marked as in ordinary specimens. The markings on the under side are almost similar.

No. 2 is a beautiful variety of *A. villica*. The first example of this striking form was taken here more than twenty years ago. It was discovered by Colonel A. J. H. Ward, D.L., V.D., sitting on a bush in his garden; and he was so struck by its beauty that he sent and asked me to come and look at it, as he thought it might be of use to me. Of course I was delighted when I saw it, and boxed it at once! Since then I have bred a few, and nearly always of the same type; as it seems to be peculiar to this neighbourhood, I think it deserves a varietal name, and I have therefore called it *wardi* in honour of its finder. There is no need to give a description as the figure is so clear. It seems to be a very uncommon variety, for I have not bred many out of the hundreds of larvæ I have reared year after year. In addition to this form, I have bred one or two nice specimens having the basal spots of upper wings united.

No. 3 is an extremely beautiful and asymmetrical variety, and was the only variety bred out of some two hundred larvæ I reared last season.

Lee House, Dovercourt, February 7th, 1914.

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## NEW AND LITTLE KNOWN BEES.

By T. D. A. COCKERELL.

*Anthophorula bruneri* (Crawford).

Dallas, Texas, on *Helianthus*, September 22nd, 1905, four males (F. C. Bishopp).

*Anthophorula morgani*, sp. nov.

♀. Length 6 mm. or slightly over; black, closely related to *A. bruneri*, but differing thus: smaller (size of male *bruneri*); wings greyish, nervures and stigma dull dusky reddish (stigma in *bruneri* is clear amber); hair on inner side of hind basitarsus dark fuscous; abdominal hair-bands whiter. The dusky stigma, dark tegulæ and well punctured mesothorax readily separate it from *A. texana* (Fries). The well punctured mesothorax separates it at once from *A. coquilletti* (Ashm.). From *A. compactula* (Ckll.) it is known by the less brightly coloured flagellum, the black or piceous tegulæ, and the broad,

shining, hardly punctured hind margin of first abdominal segment. There are three submarginal cells.

*Hab.* Falfurrias, Texas, on *Helianthus*, May 18th, 1907 (A. C. Morgan).

*Exomalopsis frederici*, sp. nov.

♂. Length about  $8\frac{1}{2}$  mm., expanse 16; black, mandibles dark red except at base, tibiæ at apex, and the tarsi ferruginous; hair of head and thorax long and abundant, shining white on face, cheeks and under side of thorax, fulvous on head and thorax above, very bright on anterior half of mesothorax; flagellum obscure brown beneath; vertex shining; ocelli large, in a scarcely curved line; mesothorax closely and distinctly punctured, except on disc posteriorly, where it is shining and sparsely punctured; base of metathorax with strong punctures and small shining spaces; tegulæ bright reddish-amber; wings clear, dusky at apex, stigma and nervures clear amber-colour; stigma large; b. n. going far basad of t. m.; second s. m. broad, receiving first r. n. far beyond middle; legs with pale hair, fulvous on inner side of tarsi, middle and hind tibiæ with dark fuscous hair on outer side; hind tibiæ thick, but legs otherwise ordinary; abdomen shining, very finely punctured; hind margins of second and following segments with entire pale fulvous hair-bands, that on second narrow and submarginal; segments before the bands with fine short hair, only clearly seen in side view, that on second ochreous, on the others black; apex of abdomen broadly rounded, ferruginous.

*Hab.* Mexico (F. Smith coll., 79, 22). British Museum. In Friese's table of *Exomalopsis* this runs to *E. planiceps*, Sm., which differs conspicuously in the colour of the pubescence.

The insect looks rather like a small *Diadasia*. The hind spur is strongly curved at end.

*Cœlixys ardescens*, Cockerell.

Guayaquil, Ecuador, one male, one female (v. Buchwald; Alfken coll. 6). These are quite identical with the Brazilian *C. ardescens*. The female, not before known, is about 13 mm. long, and resembles the male except in the usual sexual characters. The last dorsal segment of abdomen is keeled, and ends obtusely; the last ventral is rather broad, and is narrowed, but not distinctly notched, before the end. The insect reminds one of *C. otomita*, Cress., from which it differs especially as follows:—Ridge between antennæ high, extending down to clypeus, which is obtusely elevated in the middle (the lower edge of clypeus is shallowly emarginate); middle of mesothorax with sparser and smaller punctures; middle of apical margin of clypeus much less angulate; last dorsal segment much broader apically; last ventral broader, and rather abruptly narrowed before the end. In Schrottky's table of Brazilian species this female runs to *C. pygidialis*, Schrottky, but differs from it by the absence of a median tooth on scutellum and a ventral keel on abdomen.



*Cælioxys sanguinosus*, Cockerell.

Guacimo, Costa Rica, June 21st, 1903, one female (J. C. Crawford). U.S. National Museum. The last ventral segment has a well-defined tooth-like apex, whereas the type has only a nodule, but the specimens are evidently conspecific.

*Cælioxys azteca*, Cresson.

San José, Costa Rica, May 31st, 1903, "on orquetilla," one female (J. C. Crawford). U.S. National Museum.

*Cælioxys texana sonorensis*, subsp. nov.

♂. Length about  $8\frac{1}{2}$  mm.; face densely covered with white hair; first two joints of antennæ dark red, the others black; hair on eyes shorter than in male *texana* from Wisconsin; region surrounding middle ocellus strongly elevated; mandibles with a red subapical spot; cheeks thinly covered with white hair, more densely below (*texana* from Wisconsin has a large bare space, wholly wanting in *sonorensis*); mesothorax closely and very coarsely punctured; two conspicuous spots of creamy hair on anterior margin, and a thinly hairy triangle between; scutellum densely punctured, the hind margin with pale hair, and not tuberculate or angular; tegulæ clear bright ferruginous; first r. n. joining second s. m. at extreme base; legs bright clear ferruginous, the tarsi strongly dusky; spurs clear red; abdomen clouded with red at sides and beneath; apical segment deeply excavated, with three teeth on each side, but one of them more or less bifid, no median tooth; fourth ventral segment with two red teeth on apical margin, not extending beyond the fringe of white hair.

*Hab.* San José de Guaymas, Mexico, April 10th (L. O. Howard). This insect has caused me some perplexity, because, except for the smaller size, it agrees fairly well with Cresson's brief account of male *texana*. It is certainly quite distinct from the Wisconsin insect which Dr. Graenicher has sent me as *texana*; but Dr. Graenicher's female, which certainly seems to belong with the male, appears to be veritable *texana* as described by Cresson. Dr. Howard's bee has the appearance of a desert insect, and should be distinct from the Texan species, which may well range into Wisconsin. Very possibly the new form represents a distinct species, *C. sonorensis*, but until it is compared with the type of *texana* it may be given only subspecific rank.

In my table of male *Cælioxys* in Canadian 'Entomologist,' *C. sonorensis* runs to *C. quercina*, Ckll., differing by the absence of a median process at end of abdomen, the rounded (instead of squarely truncate) hind margin of scutellum, the red colour at sides of abdomen beneath, and the smaller size. It is allied, however.

*Cælioxys otomita bicarinata*, subsp. nov.

♀. Exactly like *C. otomita*, Cresson, except that the clypeus has on its lower two-fifths a pair of parallel longitudinal ridges, with a depression between.

*Hab.* Guayaquil, Ecuador (v. Buchwald; Alfken coll. 7). *C. leporina*, Sky., has a deeply sulcate clypeus, but is very different from *bicarinata*. Our insect is in many respects similar to *C. tumorifera*, Ckll., based on a male from Peru. There are, however, many differences; thus in *tumorifera* the occipital margin is a long way from the ocelli, in *bicarinata* it is close to them.

*Cœlioxys triodonta*, sp. nov.

♂. Length about 10 mm.; black, with the tegulæ, legs, under side of abdomen (except bases of segments) and extreme sides of abdomen more or less, all dark ferruginous; antennæ black, the last two joints ferruginous basally; mandibles dark red; face narrow, densely covered with pale golden hair; hair on eyes short; cheeks with a smooth bevelled space below; hair of thorax yellowish, no distinct spots on mesothorax anteriorly; mesothorax with very large punctures, well separated on disc posteriorly; scutellum short, strongly punctured, but smooth on each side of the delicate median keel, which leads to a prominent marginal tooth; axillar spines long, and nearly straight seen from above; wings dilute fuscous; anterior coxæ with large red spines; spurs red; abdomen shining, the hair-bands as usual, but weak; fifth segment with a red spine on each side; sixth with six large spines, and a very short and small, but distinct, median one; fourth ventral segment with two short dark spines close together; fifth with a deep oval depression.

*Hab.* Guayaquil, Ecuador (v. Buchwald; Alfken coll. 8). Very similar to *C. leucochrysea*, Ckll., also from Guayaquil, but *leucochrysea* has the face broader below, hair on eyes shorter and white (yellow in *triodonta*), last two antennal joints wholly black, median tooth of scutellum much less prominent, and axillar teeth shorter and more curved, no median apical tooth on abdomen, lower apical spines longer and more parallel. By the structure of the scutellum, *C. triodonta* is related to *C. beroni*, Sky., but the latter is much larger, and has no median apical tooth on abdomen.

*Cœlioxys costaricensis*, sp. nov.

♀. Length about 10½ mm.; black, with the mandibles, apex of labrum, tegulæ, mesothorax (except a large posterior triangular area), outer face of axillæ, tubercles, mesopleura, under side of abdomen and marks on lateral margins (large areas on first segment), all red; hair of eyes very short; mandibles strongly tridentate; labrum nearly twice as long as wide, with a deep basal pit; clypeus convex, densely rugosopunctate; no prominent keel between antennæ; antennæ wholly black; the large punctures of mesothorax well separated on disc posteriorly; scutellum strongly punctured, with a smooth median keel, the hind margin conspicuously angulate, the end of the keel projecting as a small tooth; axillar teeth only moderately long, distinctly curved; wings dilute fuscous, the apical margin darker; anterior coxæ with short spines, densely covered with white hair beneath; anterior margin of mesothorax with a narrow band of yellowish hair, but no patches; hind tarsi with

orange hair on inner side; spurs red; middle of abdomen with the punctures sparse and small, on the fifth segment minute but close, in abrupt contrast; hind margins of segments, and edge of basin of first, with conspicuous but very narrow white hair-bands, but no other hair-bands or markings; sixth dorsal segment delicately keeled, gradually narrowed apically, and turned up at extreme tip; last ventral rather narrow, with a very apical part, not extending far beyond dorsal; sides of last ventral with long but not dense hairs; ventral segments with strong white marginal hair-bands; last ventral black or nearly, contrasting with the bright red segment before it.

*Hab.* Guapiles, Costa Rica, June 18th, 1903 (J. C. Crawford). U.S. National Museum. This species may be compared with some of those described by Cresson from Mexico, from which it is readily separable as follows:—

Last dorsal segment abruptly contracted on each side, the apical part much narrower than the basal ... *chichimeca*, Cress.

Last dorsal gradually tapering to apex..... 1.

1. Last dorsal turned upward at tip; last ventral straight  
*costaricensis*, Ckll.

Last dorsal not turned upward at tip; last ventral strongly curved downward ..... *totonaca*, Cress.

*C. costaricensis* is in many ways similar to the South American *C. quarens*, Holmbg., to which it runs in Holmberg's table.

*Cœlixys luzonicus*, sp. nov.

♂. Length about 7 mm.; black, head and thorax above very densely punctured; head broader than thorax; mandibles entirely black; hair on eyes short; face and front with pale golden hair, and scape beneath with long hair of the same colour; antennæ entirely black; mesothorax with even posterior middle excessively densely punctured; cheeks covered with white hair, no hairless area below; occiput with white hair; mesothorax with very thin golden-brown hair, only distinct anteriorly; pleura, tubercles and sides of meta-thorax densely covered with pure white hair; scutellum dull, very densely rugosopunctate, short, the margin simple, except when looked at from in front, when two very small obscure nodules appear; axillar teeth short; tegulæ black; wings dilute fuscous throughout; b. n. meeting t. m., first r. n. joining second s. m. very near base; legs entirely black, with white hair; hair on inner side of hind tarsi orange-fulvous; spurs fuscous; abdomen shining, strongly but not densely punctured, the hair-bands pure white; marginal hair-bands confined to sides, where they form broad patches, on first segment sending a very large lobe basad, and a thin line mesad to near the middle; subbasal bands developed as small stripes on sides of third segment, but nearly meeting in middle on fourth and fifth; sixth segment very short and broad, with very small lateral basal teeth (minute ones also on fifth), and six (three pairs) at apex, four above, and two (longer) below; ventral segments with broad white hair-bands, the first with a median patch of hair extending from base to hind margin, but the margin otherwise bare.



*Hab.* Los Banos, Luzon, Philippine Islands (Baker, 1800). Closely related to *C. capitatus*, Sm., from India, and *C. sumatrana*, Enderl., from Sumatra. It is known from *capitatus* by the absence of spots on the mesothorax anteriorly and the interrupted abdominal bands; from *sumatrana* by the clear white hair of sides of thorax, and other details of coloration. The male of *C. philippensis*, Bingh., is much larger, and has the sixth segment of abdomen elongated, with the upper apical teeth (two pairs) very short. It is related to the Indian *C. basalis*, Sm.

*Ceratina tropica*, Crawford.

Los Banos, Philippine Islands (Baker, 1787).

*Allodape cupulifera*, Vachal.

Los Banos, Philippine Islands (Baker, 1788). The female is only 5 mm. long, with the base of the mandibles dark, and no lateral face-marks. It can be distinguished from *A. marginata*, Sm., by its smaller size.

*Megachile aurantipennis*, Cockerell.

Cacao, Trece Aguas, Alta Vera Par, Guatemala, March 24th, two males (Schwarz & Barber). U.S. National Museum.

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## CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ. No. I. METEORIDÆ.

By G. T LYLE, F.E.S.

(Concluded from p. 77.)

*Meteorus pulchricornis* (Wesm.).—Probably the commonest species we have; it is easily recognized by the pale anterior margin of the otherwise fuscous stigma, and by the invariably black first abdominal segment. The metathorax is also generally black, though I possess a specimen in which it is entirely testaceous. A most variable species in size and colour; quite half my females may be referred to Marshall's var.  $\alpha$ ; and although I have seen no males of this form, I have several approaching vars.  $\beta$  &  $\gamma$ . My largest specimen, a female, bred from a larva of *Agrotis* (*Lycophotia*) *strigula*, measures 11 mm. in expanse, while the smallest, also a female, bred from a larva of *Cerostoma radiatella*, expands only 6 mm. Marshall describes the second cubital areolet as "slightly narrowed towards the radius," but in several of my specimens it is considerably so. The larva is pale green, with the parts of the mouth black and the spiracles on segments one and two also outlined in black.

A solitary parasite of larvæ of Lepidoptera. There are



certainly three and probably four broods in the year, the first appearing in April and early May, the second in June and July, the third in August, and the fourth during September and October; the individuals of this fourth brood no doubt deposit their ova in larvæ which hibernate, such as that of *A. (L.) strigula*, which I have known to produce the parasite larva so early in the year as the second week in March.

The cocoon is brown, shining, and pensile (fig. 5).

Bred on very many occasions from March 31st to May 15th, from larvæ of *Agrotis (Lycophotia) strigula*, and from June 12th to July 4th from larvæ of *Cheimatobia brumata*; also from larvæ of *Thecla quercus*, June 30th, 1909; *Thecla betulæ*, June 17th, 1912; *Pæcilocampa populi*, June 24th, 1910; *Cilex glaucata*, July 20th, 1911; *Nola cuculatella*, June 29th, 1911 and July 5th, 1911; *Eupithecia abbreviata*, July 5th, 1911; *E. nanata*, August 15th, 1913; *Hybernia leucophæaria*, July 3rd, 1913; *Phibalocera quercana*, July 26th, 1911, and *Cerostoma radiatella*, July 9th, 1913.

On July 27th, 1911, I bred a female specimen of the Ichneumonid *Panargyrops æreus*, and on July 7th, 1909 and July 4th, 1911, examples of *Mesochorus crassimanus* (Holmg.) from cocoons of this species, the host in these cases being *Cheimatobia brumata*. I have also obtained *Mesochorus tetricus* as a hyperparasite (April 13th, 1911), the host being *A. (L.) strigula* and a Chalcid (*Perilampus*), rather commonly from cocoons of the second brood; the last-named remains within the cocoon through the winter as a fully-formed imago, and emerges in the following spring. All these hyperparasites gnaw irregular jagged holes when leaving the cocoons (fig. 5).

*M. niger* (Lyle). (Figs. 2 & 3).—This species was brought forward by me as new in the 'Entomologist' \* for August, 1913, and further notes appeared in the number for the following month. It is a common solitary parasite of the larva of *Hygrochroa (Pericallia) syringaria*. I have recently discovered in my collection a female which was bred from a larva of *Ennomos quercinaria*, June 17th, 1911. This insect is lighter than any of those bred from *H. (P.) syringaria*, the disc of the thorax and stigma being fuscous, the second abdominal segment piceous, and the antennæ basally fulvous; in all other respects it agrees with the description.

In both sexes the antennæ are 25–27-jointed.

*M. melanostictus* (Capron).—In Trans. Entom. Soc. 1887, p. 115, Marshall describes this as a new species from five males, and mentions that the description of the other sex which he gives was communicated to him by Capron.

Although my specimens agree with these descriptions in most particulars, they differ in that the wings are distinctly

smoky, especially in the female, with a light mark under the stigma, the antennæ are 29- to 31-jointed in both sexes, and the recurrent nervure is interstitial in the female as well as in the male. In spite of these discrepancies, I believe I am right in referring my insect to this species. Three of Marshall's types are now in the National Collection, and I much regret that I am unable at the present to visit the museum and inspect them; Morley, however, has very kindly supplied me with their particulars.

A solitary parasite of the larvæ of Lepidoptera; fairly common in April and May, and again in the autumn in the neighbourhood of fir-trees. I have beaten it from Douglas fir as late in the year as December 17th, so that possibly it may sometimes pass the winter as an imago. That this is not always so I have proved by "forcing" larvæ of the host, which, taken in November when quite small, produced the parasite in the following January.

Morley was the first to record a host for the species, for in his notes\* he mentions that a correspondent sent him a cocoon, the maker of which had emerged from a pupa of *Thera variata*. In this I think Mr. Morley's correspondent must be in error, for, as regards the very considerable number of specimens bred by me, in every case the parasite has emerged from the larva of its host and spun the usual pendulous cocoon, which seems to be almost identical with that of *M. scutellator*, though perhaps rather lighter in colour (fig. 5).

I have obtained this species many times between April 4th and May 30th, from larvæ of the first brood of *Thera variata*, and from September 2nd to 29th from larvæ of the second brood of the same insect. Most of my specimens have, I believe, been bred from larvæ of the true *T. variata* (Schiff.), though I am certain that some are from *T. obeliscata* (Hüb.).† One cocoon of this species produced the hyperparasite *Mesochorus crassimanus*, September 13th, 1913.

*M. scutellator* (Nees).—A well-marked species, though variable in colour, &c. The scutellum would seem to be always rufo-testaceous, and the metathorax carinated. All my specimens have the hind tibiæ ringed with fuscous near the base. Marshall mentions that the second cubital cell is scarcely narrowed towards the radius; although this is usually so, I possess specimens in which it is distinctly narrowed, and others in which it is actually wider at the radius.

Fairly common; a solitary parasite of the larvæ of Lepidoptera. The cocoon is similar to that of *M. pulchricornis*, but larger. From twenty-four to twenty-seven days elapse between

\* 'Entomologist,' vol. xli. p. 149.

† See Prout in 'Entomologist,' vol. xlv. p. 241.

the emergence of the parasite larva from its host and the appearance of the imago, at any rate in the spring brood.

Bred by me from larvæ of *Triphena* (*Agrotis*) *fimbria*, April 29th, 1909, April 23rd, 1912, and other dates; *Agrotis* (*Lycophotia*) *strigula*, April 13th, 1911; *Noctua* (*Segetia*) *xanthographa*, April 20th, 1911, April 11th, 1911, and other dates; *Triphena* (*Agrotis*) *pronuba*, April 7th, 1911, April 13th, 1912; and from a cocoon beaten from oak, June 16th, 1911.

More than one writer has mentioned that a permanently testaceous variety exists of some species of *Meteorus*, and after examining several specimens, and comparing them with the original description, I have come to the conclusion that *M. unicolor* (Wesm.) is merely a testaceous variety of *M. scutellator*.\*

*M. versicolor* (Wesm.).—Considerable confusion seems to have arisen concerning this species. Wesmael mentions having bred it gregariously at Charleroy, from a larva of *Bombyx cassinea* (Fab.), the cocoons being brown, and connected by a few threads of silk; he also states that the terebra is equal in length to the abdomen. In the specimens since recorded, the length of the terebra is given as only half the abdomen, so that even allowing for the fact that Wesmael sometimes rather exaggerated the length of this organ, one can hardly suppose that he would double it. Again, all recent specimens are mentioned as being solitary parasites making pendulous cocoons.

It would therefore seem possible that we are wrong in referring the insects mentioned below to *M. versicolor*, as I am convinced we should be wrong in so referring the light forms mentioned by Marshall (var. *bimaculatus*).

On May 7th, 1912, I bred an example of Marshall's var.  $\beta$  from a cocoon which fell into my tray while beating young birch-trees for larvæ of *Geometra papilionaria*. Bignell records the breeding of a similar specimen from a larva of *G. papilionaria*, June 7th, 1883.

The cocoon is pendulous, shining, and much darker than that of any other *Meteorus* with which I am acquainted.

*M. bimaculatus* (Wesm.).—Although Marshall considered this to be merely a variety of *M. versicolor*, I feel sure, after referring to the original descriptions and examining a large number of specimens, that it is a distinct species. *M. bimaculatus* has the wings somewhat infumated, especially in the male, and the base of the petiole and first abdominal segment are never white, though the former is pale. In Wesmael's description of the female, the two dark spots on the first abdominal segment are mentioned as being triangular and elongate; it would perhaps

\* Since writing the above I have been much interested to find that Thomson advanced this view; see 'Opuscula Entomologica,' ii. p. 112.



be more correct to say that the segment is centrally narrowly testaceous.

As the male does not appear to have been noticed before, I subjoin the following description from ten specimens in my collection:—

Mesothorax testaceous, or fuscous, with the disc testaceous, scutellum testaceous, metathorax black (fuscous in pale specimens), rugose; abdomen piceous with the second segment and base of the third testaceous, the second often fuscous at the sides, petiole basally pale, first segment striated, tracheal grooves obsolete, tubercles apparent; legs testaceous, all the tarsi fuscous, posterior coxæ and femora at apex fuscous, posterior tibæ fuscous, basally pale, all the claws dark; head scarcely as wide as the thorax, occiput fuscous (in pale specimens testaceous), orbits, clypeus, and cheeks testaceous, face fuscous, palpi pale, antennæ setaceous, slightly longer than the body, fuscous, 30–33-jointed, usually 32; wings infumated, stigma and nervures fuscous, recurrent nervure interstitial or subinterstitial, second cubital areolet slightly narrowed towards the radius; length  $4\frac{1}{2}$  mm. to 6 mm., expands 8 mm. to 10 mm.

In the female the antennæ are about equal in length to the body, 30–33 jointed.

Var. female. First abdominal segment dark fulvous without noticeable dark triangular patches at the sides — *M. decoloratus* (Ruthe).

A solitary parasite of larvæ of Lepidoptera; it varies greatly in size. I have a female, bred from a larva of *Brachionycha* (*Asteroscopus*) *sphinx*, June 28th, 1911, which expands no less than  $11\frac{1}{2}$  mm.

The cocoon is pendulous, shining, and of a rather rich brown colour, though not nearly so dark as that of *M. versicolor*. Two specimens which I must refer to this species, bred from larvæ of *Nola cuculatella*, made cocoons of a paler colour, similar to those of *M. pulchricornis*. From six to fourteen days in the cocoon. Among other dates I have bred it from larvæ of *Macrothylacia rubi*, August 1st, 1911; *Nola cuculatella*, June 21st, 1911; *Anarta myrtilli*, August 5th, 1911; *Ematurga atomaria*, July 30th, 1911; *Cheimatobia brumata*, June 19th to 27th, 1911, and *Agrotis agathina* (Sand banks, Poole), June 23rd to 30th, 1913.

From a single cocoon of this species I bred on August 17th, 1911, some thirty or forty small hyperparasites. Dr. R. C. L. Perkins, to whom I submitted them, has been most kind in working them out, and says (*in litt.* January 15th, 1914): “The very minute species is certainly *Closterocerus* (Westwood), but the wings are not marked in black as in all described species known to me. It is quite likely that species with similar wings have been wrongly described in *Entedon* or *Eulophus*, as the marked wings have been considered a generic character. The antenna is that of a true *Closterocerus*.”



*M. filator* (Hal.).—Appears to be common, though I have only once taken it in the New Forest, on November 15th, 1910, when a female was beaten from holly. Generally found in the autumn, and is said to be a parasite of larvæ which feed in the fungus *Polyphorus versicolor*.

*M. fragilis* (Wesm.). Fig. 4.—A delicate species with long, slender antennæ and legs; the second abdominal segment is flavo-testaceous, with two black spots on the disc; these spots seem to be quite constant, and are a great help in identifying the species.

A solitary parasite of small larvæ of Lepidoptera. The cocoon is pensile, somewhat similar to that of *M. pulchricornis*, though rather more elongate and brighter brown in colour, 5–6 mm. in length. From the time the parasite larva leaves the host to the emergence of the imago from the cocoon, a period of from eight to thirteen days elapses. Bred frequently from small larvæ of *Hylophila bicolorana*, September 8th to 12th, and also once from the same host on May 9th, so that probably both spring and autumn broods prey on this larva. Also bred from larvæ of *Nola cuculatella*, June 17th, 1912, and June 19th, 1912.

*M. luridus* (Wesm.).—This is a gregarious parasite of the larvæ of Lepidoptera. The parasites leave the host and form their cocoons within the underground chamber constructed by the host for the purpose of pupation, though sometimes in captivity the cocoons are to be found scattered on the surface of the earth, or in bunches connected by a few threads. This may, of course, happen in a state of nature, but I do not think it usual. The cocoons are heaped together and are fusiform, brown, with a lighter spot at the smaller end, not shining, and covered with a thin web of filaments, as mentioned by Marshall,  $4\frac{1}{2}$  mm. to  $5\frac{1}{2}$  mm. in length. Fourteen days or so generally elapse between the emergence of the parasite larvæ from the host and the appearance of the imagines.

When courting, the male of this species follows the female with rapidly vibrating wings, repeatedly tapping the apices of her wings, which she keeps folded, with his mandibles.

I have obtained many broods, the largest consisting of thirty-two individuals, the smallest of four, and also once bred it as a solitary parasite. Females appear to predominate, for instance:—Twenty-six females, six males; fourteen females, four males; twenty-three, all females; seven, all females. I have, however, one brood of ten, all males.

Commonly parasitic on the larvæ of *Aplecta* (*Mamestra*) *nebulosa*, often quite thirty per cent. of these larvæ succumbing, yet larvæ of other Noctuæ, similar in size, collected at the same time, often from the same bushes, have not been affected. From this host I bred it on May 24th, 1908, broods of thirty-two and twenty-four; May 25th, 1908 (nineteen), June 2nd, 1908

(twenty-one), and many other times. Clutten has also bred it from the same host taken at Burnley. Bred from larvæ of *Teniocampa stabilis*, July 7th, 1911 (eight), July 23th, 1911 (eight), July 26th, 1911 (seven), and many other dates, from larva of *Graptolitha (Xylina) ornithopus*, July 24th, 1911 (four). On May 6th, 1909, I bred a single male from a small larva of *Triphaena fimbria*; in this case the cocoon was suspended by a thread an inch or so long from the roof of a breeding cage; the larva had not reversed its position, as is usual with those Meteoridæ which construct pendulous cocoons, so that the imago emerged from the uppermost end of the cocoon. I think that the unusual position of this cocoon was probably merely an accident, through the host being on the roof of the cage when the parasite larva emerged, and not at all likely to be of common occurrence. Like Marshall I have never met with any of the dark vars. described by Ruthe, and am inclined to believe that they may be referred to *M. leviventris*. The two species are certainly very close, though in *M. leviventris* the first abscissa of the radius is as long as the second, while in *M. luridus* it is considerably shorter. All my specimens of *M. luridus* are uniformly pale.

*M. leviventris* (Wesm.).—Very similar to *M. luridus* but differing in colour, being much darker. A gregarious parasite of the larvæ of Lepidoptera, said to be common.

The cocoons are fusiform, brown, rather woolly with a lighter spot at the smaller extremity,  $4\frac{1}{2}$ –5 mm. in length (fig. 9). I can detect little or no difference between them and those made by *M. luridus*, though possibly they may be rather darker and slightly smaller. Morley described the cocoon as “cylindrical, dirty white, much more woolly at the anal half and only  $3\frac{1}{2}$  mm. in length.” I have seen the cocoon from which he took this description, and although it is certainly of this species, it is dilapidated, undersized, much rubbed, and accordingly misleading. The larva is elongate, attenuate at both extremities, cream coloured, with the parts of the mouth outlined in brown, also a brown ring on either side of the first segment above; as might be supposed, it is very similar to the larva of *M. luridus*. The larvæ leave their host when the latter has prepared to pupate, so that the cocoons are to be found underground.

Bred from larvæ of *Triphaena pronuba*, November 3rd, 1913 (twenty-one), November 4th, 1913 (seventeen; ten males and seven females), and November 9th, 1913 (sixteen; seven males and six females, three failed to emerge).

I am not aware that a host for this species has been hitherto recorded.

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## A BUTTERFLY HUNT IN SOME PARTS OF UNEXPLORED FRANCE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Concluded from p. 91.)

UNQUESTIONABLY the best collecting ground near Larche is to be sought in the mountains east of and above the Col; and it was here that I took the majority of the butterflies brought home, and included in the following list:—

HESPERIIDÆ.—*Carcharodus altheæ*; not uncommon; lateral valleys of the Col de Larche; quite fresh.

*Hesperia carthami*.—A few taken; rather small.

*H. alveus*.—Flying with others of the group in the higher valleys; small as compared with examples from the Pyrenees. Var. *ryffელensis* Obthr.; not uncommon, and in fine condition, Val. d'Ornaye, but never below 7000 ft. Distinguished by the smallness of the white spots on the fore wing.

*H. bellieri*, Obthr.—The largest of the Hesperiidæ met with.\* Flies at the same altitudes as *H. alveus* and its var.

With regard to this difficult group of *Hesperia*, which, thanks to students of structure and bionomy on both sides of the Channel, is now less of a tangle even as regards the nomenclature, Guillemot contents himself (*loc. cit.* p. 33) with the remark: "Nous avons pris une certaine quantité d'autres *syrichthus*, qui viendraient sans doute se ranger dans les nombreuses espèces créées il y a peu d'années aux dépens de *fritillum*; mais je ne m'aventurerai pas à donner ici une liste de noms."

In fact, he only mentions *H. serratulæ*, common in most of the localities visited; a fine bright form, "parce qu'elle est très distincte à l'état parfait, et qu'il est impossible de la confondre"—though, I fancy, some of us find the lowland form of this species none too easy to deal with.

*H. carlinæ*.—Fairly common at high altitudes; just emerging. But I have not detected *H. fritillum*; Hb. (= *cirsii*, Rmbr.), among my Larche Skippers.

*H. cacaliæ*.—Bellier speaks of this as much rarer, and only occurring in the mountains about Barcelonnette. I did not come across it myself, but I saw a recently captured specimen or two from the Val de Lauzanier in Mr. Morris's boxes.

*Pyrgus sao*.—Generally distributed, and with the deep crimson-lake colouring of the under side usual to high Pyrenean forms.

*Thymelicus lineola*.—Common in the pastures and on rough herbage by the roadsides.

\* In the 'Entomologist' (vol. xlv. p. 11) I stated my belief that this butterfly would also turn out to be a separate species. I have not had long to wait for a confirmation of its specific identity by M. Oberthür and Dr. Reverdin. The Hesperiid flying at much the same level near the Lac d'Allos I should suggest as intermediate between var. *foulquieri* and the type, as I conceive it, *bellieri*.



LYCÆNIDÆ.—*Chrysophanus virgaureæ*.—Males only out.

*C. hippothoë*, var. *eurybia*.—Males over; isolated females in all states, from freshly emerged to mere "rags of quality," chiefly the latter.

*C. dorilis*, var. *subalpina*.—Rare.

*C. phlæas*.—Very rare; probably between the two generations (?) at this altitude.

(*Lycæna alcon*.—Mr. Morris and Mr. Tucker had fine series of this butterfly from the neighbourhood of Barcelonnette. Not met with by me.)

*Cupido minimus*.—Nearly over.

*Nomiades semiargus*.—Very occasionally.

*Agriades damon*.—The commonest "Blue" round Larche, and in pastures by the river on the Lauzanier route; females predominant, with several ab. *maculata*, Reverdin.

*A. corydon*.—Scarce; males only here and there.

*A. hylas*, *A. escheri*.—Not common.

*Polyommatus icarus*, *P. eros*.—Generally common from the village to the Col, and on both sides of the Ubayette. Females by no means scarce. A large form compared with the Swiss.

*P. medon*.—Quite common.

*P. orbitulus*.—Seemed to be very rare; one or two only at the highest levels explored (8000–8500 ft.).

*P. pheretes*.—Locally common. The females taken by me in the Ornaye valley, and the mountains generally to the south-east of Larche, are so distinctive in appearance, when placed side by side with examples from other alpine localities, as almost to constitute a variety. The ground colour of all the wings on the upper side is black; not dark or cinnamon brown, as in those of my collection from Switzerland, the Brenner, Stelvio, &c. But the most marked feature is the discoidal spot on the fore wings, usually obsolescent or insignificant in size and black in colour. Here it is large, and of the same lovely azure hue as of the wings of the male; while the basal area of all four wings on the upper side is also heavily scaled with blue of the same depth and brilliancy; this latter character absent in many, but not all of the Swiss and Eastern Alps forms of my acquaintance. I propose, then, for this Larche form, if not already named, the name *azurica*, new ab., female. The female *Lycænids*, as in the case of *damon* cited above, show a regional tendency to develop blue spots on the upper side of the wings.

(*P. optilete*, taken by Guillemot on the slopes which reach down to the Lac de la Madeleine, and one of the rarest of the group in the French Alps, I did not encounter.)

*Plebeius argyrognomon*.—Not common. Females of the brown type.

*P. argus*.—Common, but both sexes getting rather *passés*.

I observed no *Theclids* at Larche, and I see that Guillemot failed to do so.

PAPILIONIDÆ.—*Papilio machaon*.—A single fresh male in the Val d'Ornaye at about 8000 ft.

*Parnassius apollo*.—Not at the higher levels. Fairly common below Larche.

*P. delius*.—From the upper Ubayette valley to about 8500 ft., in the Val d'Ornaye. Fairly common; males only observed or captured.



*Pieris brassicæ*, *P. rapæ*.—Both rare.

*Colias phicomone*.—The commonest *Colias*.—*C. edusa*, *C. hyale*.

NYPHALIDÆ.—*Argynnis aglaia*.—Common.

*A. niobe*.—Less so. I do not remember seeing *A. adippe*, nor does Guillemot record it.

*Issoria lathonia*.—Common, especially just outside the village towards the Col.

*Brenthis pales*.—At sufficient altitudes; but the commoner was undoubtedly *B. arsilache*, of which I took a lovely blanced female aberration in the Val d'Ornaye, a few minutes' walk from the main road. In this example the rufous ground of the upper side of the fore wings has entirely disappeared, and the ground colour is creamy white (= *primula*, new ab.). The same peculiarity is observable on the hind wings, but the failure of colour less pronounced. At a distance the butterfly rather suggested a female *C. phicomone*, but the different flight, sluggish and hesitating, fortunately caused me to make a closer inspection. A tendency to albinism was decidedly noticeable in the Larche females of *arsilache*. Of *pales*, Guillemot speaks of the var. *napæa*—the familiar violet-shot female form—at Godessart; and I took two of this variety in the Val d'Ornaye, among others typical.

(*Melitæa cynthia*.—Reported from the Pain de Sucre, and one at Malmorte by Guillemot, not observed at Larche; nor *M. aurinia* var. *merope*, which may have been over.)

*M. varia*.—Occasionally.

*Pyrameis cardui*.—Rare.

*Aglais urticae*.—Just emerging, and brightly coloured.

*Pararge mæra*.—On the wane.

*Epinephele jurtina*.—Not common.

*E. lycaon*.—Less rare, and in good order.

*Cænonympha iphis*.—Common in all the meadows—Val d'Ornaye, Val de Lauzanier, &c.

*C. pamphilus*.—Some of the females very large, the size of average *C. tiphon*.

*C. darwiniana*.—Rare.

*Erebia epiphron*.—Many of the males and females examined were much nearer to the type than to var. *cassiope*; but none of the females show white-pupilled ocellation. Not common.

*E. mnestra*.—Well distributed; var. *gorgophone*, Col de Larche.

*E. alecto*, var. *duponcheli*, Obthr. (= *pluto* Esp. ?).—Not uncommon at about 8000 ft. No typical *alecto*, or var. *glacialis* observed.

*E. ceto*.—One female in the grass where the stream crosses the path up the Val d'Ornaye.

*E. stygne*.—Over.

*E. scipio*.—One male only taken, on the 26th, flying with numerous other *Erebias* in the Val d'Ornaye below the "*alecto*" line. Although I worked this place three or four times subsequently, I did not meet with another, and I expect the species was only just coming out. It is stated by Guillemot to occur on the rocky slopes below the last pastures of Ozglosse, and on the left bank of the Ubayette above the junction of that river with the Ubaye.

*E. euryale*.—Here and there flitting over alder bushes, just above the village.

*E. goante*.—Common in the same localities, but going much further up, and even flying over the skrees.

*E. gorge*, with *E. alecto*, var. *duponcheli*, and occasionally of the ab. *erynnys*.

*E. tyndarus*.—Not so common as usual; all of the var. *cassioides*.

*E. lappona*.—Common, but wasted, even high up.

January, 1914.

## DORSET HYMENOPTERA.

By F. H. HAINES, D.P.H., M.R.C.S., L.R.C.P.

THE following are some of the less generally recorded Aculeates, noted by me, in this neighbourhood of heath, wood, and down:—

*Formica sanguinea*, Latr., Parley heath; *Ponera contracta*, Latr., two workers, May 23rd, 1913, West Lulworth cliffs; *Myrmica sulcinodis*, Nyl., one female, September 9th, 1913, Ringstead. *Mutilla europæa*, L., not infrequent on the heaths. In 1911 I took a fine female as early as May 27th at Morden, and in 1908 I took a female at Moreton on May 29th. My latest date is October 7th, 1912—a rather large male, on West Knighton heath. At Arne, on August 25th, 1913, I found a nest of *Bombus jonellus*, Kirb., in a disquieted state, attributed by me to a high tide having reached it. Noting that only workers were to be seen, I carried a portion—only  $4\frac{3}{4}$  in. in circumference—home. From both larger and smaller cocoons *M. europæa* emerged through round, jagged holes: thirteen females between August 29th and September 5th, four males between August 29th and September 10th, but no *B. jonellus*. I still have the fragment under observation. *Methoca ichneumonides*, Latr., one female, September 11th, 1910, on Godlingston heath; *Pompilus unicolor*, Spin., one female, September 3rd, 1910, Arne; *Salix affinis*, V. de Lind., two females, July 27th, 1912, on West Knighton heath, and one female, August 3rd, 1912, on Studland heath; *Ceropales maculatus*, F., common in August, on *Angelica*; *Stigmaeus solskyi*, Mor.; *Passalæcus corniger*, Shuck.; *Mimesa equestris*, F., commoner than *M. bicolor*, Jur., July, on *Heracleum*; *Gorytes campestris*, L.; *G. quadri-fasciatus*, F.; *G. laticinctus*, Lep., one female, Moreton, July 12th, 1910, one female June 22nd, 1912, and one female and three males in July, 1912, on *Ceanothe* and *Heracleum*; *Nysson interruptus*, F., end of May and June, on *Anthriscus* and *Chærophyllum*; *Mellinus subulosus*, F., *Cerceris 5-fasciata*, L. I have two specimens of an *Oxybelus*, quite similar to the common *O. uniglumis*, L., but with pale mandibles; I think only a variety of it. *Crabro tibialis*, F.; *C. capitosus*, Shuck.; *C. sig-*

*natus*, Panz., one specimen; *C. vagus*, L., a block of rotten wood, containing pupæ of this very common insect, seen on November 14th, 1911, produced imagines towards the end of the following June. The cells appeared, from the *débris*, to have been stored with *Lucilius cæsar*, L., and two other species of *Muscide*, but I cannot retrieve my note on the point. *C. lituratus*, Panz., on *Heracleum*, common in one spot, in a wood; *C. interruptus*, De Geer, one female, July 31st, 1913, Upper Bockhampton; *Odynerus lævipes*, Shuck., one male, June 11th, 1913, Coombe wood; *O. herrichii*, Saussure (*basalis*, Sm.), one female, July 24th, 1912. On July 12th, 1913, I found a large colony on a limited stretch of sandy hollow on a heath, visiting *Erica*, and took both sexes. One female taken was, apparently, just entering her burrow with a small green lepidopterous larva (unfortunately lost before full examination) in her mandibles. I had not time to dig out the cells. The hole was on a flat bare spot. No other burrows were seen in proximity, despite gregarious habits common to other species of *Odynerus*. On July 21st there were but one or two examples about. I took one female *O. pictus*, Curt.; *O. sinuatus*, F.; *Eumenes coarctata*, L., common on the heaths; *Colletes succinctus*, L. I have a specimen with only two submarginal cells in its wings, otherwise normal. *Prosopis confusa*, Nyl.; *Sphcodes reticulosus*, Thoms., one female, July 12th, 1910, Moreton; one female, June 2nd, 1913, East Stoke; *S. variegatus*, v. Hag.; *Halictus prasinus*, Sm.; *Andrena pilipes*, F.; *A. bimaculata*, Kirb., one female, August 1st, 1912; *A. rosæ*, Panz. (v. *spinigera*, Sm.); *A. apicata*, Sm., one female, April 17th, 1911, in a wood; *A. præcox*, Scop.; *A. fuscipes*, Kirb., common on the heaths; *A. hattorfiana*, Fab.; *A. cetii*, Schr., common on *Scabiosa* in July, August, and September; *A. chrysosceles*, Kirb.; *A. analis*, Panz.; seems rather peculiarly liable to abnormal venation. In a short series a male (on one side) and two females (on both sides) show but two submarginal cells. *A. argentata*, Sm., Studland heath; *A. dorsata*, Kirb.; *A. similis*, Sm.; *Macropis labiata*, F., not uncommon on *Lysimachia* in July and August; *Cilissa hæmorrhoidalis*, F.; *C. leporina*, Panz.; *Panurgus calcaratus*, Scop., common; *P. ursinus*, Gmel., very common; *Nomada roberjeotiana*, Panz.; *N. bifida*, Thoms., very common; *N. borealis*, Zett., not uncommon; *Epeolus rufipes*, Thoms.; *Celioxys quadridentata*, L.; *C. acuminata*, Nyl.; *Megachile circumcincta*, Lep.; *M. ligniseca*, Kirb.; *M. versicolor*, Sm., four females, earliest June 16th, 1912, latest August 25th, 1913; *Osmia pilicornis*, Sm.; *O. aurulenta*, Panz., common on *Ajuga* in May; *O. bicolor*, Schk.; *O. leucomelana*, Kirb., one male; *O. spinulosa*, Kirb.; *Melecta luctuosa*, Scop.; *Podalirius retusus*, L.; *P. furcatus*, Panz., common, fond of *Stachys sylvatica*.

Brookside, Winfrith, Dorset: February 24th, 1914.



## NOTES AND OBSERVATIONS.

QUERY RESPECTING *PLUSIA CHRYSON* (*ORICHALCEA*).—Does "*orichalcea*" ever pupate in the autumn? Last October I beat two large and unmistakably *Plusiid* larvæ on *E. cannabinum* in the locality where I expected to find *orichalcea*, and to my surprise both went down in late October. I cannot believe that they are *P. gamma* or *P. chrysitis*. —CHARLES MELLOWS; The College, Bishop's Stortford.

DERMATOBIA IN GUATEMALA.—In February, 1912, at Quirigua, Guatemala, my wife heard an Indian screaming with pain, and found that there was a dipterous larva under the skin of his arm. The larva was extracted, and I find that it agrees exactly with descriptions and figures of *Dermatobia*, especially fig. 11, *a*, in 'Insect Life,' September, 1888, p. 80. Authors have referred to two species of *Dermatobia*, but Blanchard (Ann. Soc. Ent. France, lxx., 1896) goes into the matter at great length, and shows that the records all apparently refer to a single species, *D. cyaniventris* (Macq.).—T. D. A. COCKERELL.

STOMOXYS AT A HIGH ALTITUDE.—On August 28th, 1913, I collected *Stomoxys calcitrans* (L.) in a cabin at timber-line, 11,200–11,300 ft., on the Long's Peak trail, Colorado. At same time and place I also obtained *Phormia terre-novæ* (Mcq.), *Musca domestica*, L., and *Allograpta obliqua*, Say.—T. D. A. COCKERELL.

RETARDED EMERGENCE OF PARARGE EGERIA.—With reference to Major Robertson's interesting notes in the March number of the 'Entomologist,' I have been looking up my diary, and find that, whilst pupæ digging under an elm on October 9th, 1909, I found a charming green pupa suspended to a grass stem. Feeling satisfied that it was rather unusual to find such a pupa during the winter months, I watched it very carefully through the following months, and was very surprised to see a fine male specimen of *P. egeria* had emerged on May 1st, 1910.—W. W. MACMILLAN; Woodville, Castle Cary, Somerset, March 9th, 1914.

TROPICAL GRASSHOPPERS (*PHANEROPTERIDÆ*) IN ENGLAND.—A pair of grasshoppers taken alive in a hothouse near Felixstowe were sent me in December by a correspondent. Some orchids from India had recently been placed there. The insects belong to the *Phaneropteridæ*, but are not of the genus *Phaneroptera*. They lack the spine on the anterior coxæ, and are larger than either *falcata* or *quadripunctata*. The male has a beautiful reddish-brown border to the elytra, wing-tips, and centre of pronotum. The female is much larger and of a brilliant green, including the wing-tips. I have requested my correspondent to watch for nymphs later in case the pair bred.—C. W. BRACKEN; 5, Carfax Terrace, Plymouth.

A VARIETY OF *PYRALIS COSTALIS*.—In July, 1906, I took, at sugar, a very remarkable variety of this pretty little species. The bright rosy grey of the wings is replaced by deep maroon, or plum colour, there are no signs of any transverse lines across the fore wings, and



the large yellow spots upon the costa are represented by a minute dull yellow spot near the apex; the fringes are dull orange, tinged with pink, instead of the clear yellow of typical specimens. I propose *unipunctalis* as a varietal name for this striking form. It is a very common species here, and I have often seen it swarming at sugar on old pollard willow trees.—GERVASE F. MATHEW; Lee House, Dovercourt, Essex, February 24th, 1914.

SOME VARIETIES OF *GONODONTIS BIDENTATA*.—In the early summer of 1911 Commander Gwatkin-Williams, R.N., sent me some ova of *bidentata* from County Cork, and I placed them in a large sleeve over the branch of an ash tree in my garden. In due course the larvæ hatched, fed up, and pupated. The following spring a number of moths emerged; these were a very varied lot, hardly one of them being typical, and there were some very beautiful forms among them, the following being the most conspicuous:—(1) A pale straw colour, something the shade of *Crocalis elinguaris*, with very faint transverse lines, the discoidal spots very small, and all the wings sparsely dusted with very minute brownish atoms. A very beautiful variety. (2) Somewhat similar to the above but slightly darker—biscuit colour would perhaps best describe it; the transverse lines and discoidal spots more distinct, and the irrorations more pronounced. (3) This is much the same colour, but of a slightly richer tone, and with the transverse lines and discal spots very distinct. (4) Pale ochreous, transverse lines and discal spots rather faint; irrorations very distinct, and grouped in patches towards the outer margin of fore wings. (5) Golden-brown, transverse lines rather distinct, and in one or two specimens outwardly edged with white; irrorations obsolete. (6) Warm brown, transverse lines somewhat faint, the outer one dotted with white spots; irrorations indistinct.—GERVASE F. MATHEW; March 9th, 1914.

BUTTERFLY COLLECTING IN SICILY AND CALABRIA IN 1912 AND 1913.—It is a truism that the weather often makes or mars the success of an excursion in search of butterflies, and my recollections of a visit to Sicily in 1912, where I spent the month of April, chiefly comprise high winds, dust, and torrents of rain. Contrary to my usual experience I left England bathed in sunshine, and on the railway banks between Modane and Turin I saw several specimens of *Euchloë euphenoides* flying about gently (March 29th), and during a compulsory stop of six hours at Rome I watched females of *Pieris rapæ* depositing their eggs on the herbage in the grounds of the Villa Borghese (March 30th), but south of Naples clouds hid the sun, and in Sicily (March 31st) rain and wind held sway. My record of the weather for the month of April is nine wet days, nine showery or dull days, six bright sunny days, and six days with occasional sunshine. To be detained indoors by rain or wind was very provoking, at a time too when the newspapers brought news of sunshine in England. On April 5th I took train *via* Catania to Randazzo at the back of Mount Etna for the week-end, but my visit was a failure, as clouds hid the summit of the volcano. On former visits I have found a great scarcity of larvæ, the plants showing no signs of having been eaten, but this season the patches of nettles

were black with larvæ of *Vanessa urticæ*, perhaps the effects of a migration, and nests of larvæ of the Sicilian Lackey Moth. *Clisiocampa franconica* were very numerous, there were thousands of larvæ almost ready to scatter. (Is this a biennial? it was common in 1910 at Messina.) On April 9th the sun succeeded in making its appearance in the forenoon, and at once butterflies appeared in every direction, all in lovely condition. They included *Thais polyxena*, *Euchloë damone*, and of course *cardamines* and blues and whites. Unfortunately the sunshine lasted little over an hour, and was followed by clouds and a gale of wind, which quickly transformed the roads into a cloud of dust and ashes. Next day the gale continued, so I started back to Messina by the Circum-Etna Railway. Eight miles from Randazzo, near the village of Sollichiana, the eruption of Mount Etna in 1911 had destroyed the railway track for about half a mile, and passengers had to detrain at Sollichiana, and walk over the lava stream of still heated ashes, and on to the next station—Castiglione—a distance of two and a half miles. With true Sicilian dilatoriness, no provision had then been made to fit in trains, and ours being an hour late, we found that the forenoon train had departed, and we had six hours to wait for the next train. (Later this was remedied.) Fortunately the wind was at our backs, and the road all down hill, so I decided to walk to the nearest station on the main line—Fiumefreddo, Sicilia—some ten or a dozen miles, and was fortunate just to catch a train. What with the reddish dust of the roads and the black ashes of the lava stream, I had the appearance of a Red Indian, and I felt no desire to visit the Sahara.

Showery weather and the scirocco kept me indoors at Messina until April 14th, when a sunny morning tempted me up the nearest torrent-bed to the Cataract (Cattarati), a fine sight after the rain. I followed the gorge to the top of the hill (3000 ft.) and returned through the pine wood (the Bosco) and down the adjoining torrent-bed (Cammari). Butterflies were scarce after the rain, but those taken were in excellent condition, and included *Euchloë ausonia* and *cardamines*. The lovely views from the hill and in the rocky gorges made ample amends for the fatigue of the journey.

My favourite short walk near Messina is to Gravitelli, where there is a rocky gorge that rivals the dripping well at Knarborough, and the Emperor butterfly *Charaxes jasius* is sometimes common on the slopes in June. On April 16th and 19th I searched the *Arbutus* bushes close to a solitary pine tree that dominates the gorge, and obtained four larvæ; apparently the larva spins a white silken web on the upper side of a leaf, either for hibernation or at its last moult. Larvæ of *Lasiocampa* (*Bombyx*) *quercus* like to sun themselves on the same plant, and in the gorge *Vanessa egea* flies rapidly; I caught one good specimen, and *Leucophasia sinapis* was very plentiful.

With improved weather, I ventured to repeat my week-end visit to Randazzo, stopping during Sunday at Taormina, the most lovely health resort of Sicily. Once more luck was against me, and the grand view of Mount Etna from the Greek theatre at Taormina was denied us, and in its place was nothing but mist. I stopped three

days at Randazzo, and on April 23rd I had one hour's sunshine and secured three male and three female *damone*. Rain followed and I left on the 25th, with Mount Etna still hidden by clouds.

Still another week-end without any luck. The feast of St. Joseph provided an opportunity to cross the Straits and visit Scylla in Calabria with my son. The early morning was promising, and at 6 a.m. we were climbing the steep hill (2000 ft.) leading from Scylla to a plateau above, where *Melanargia arge* has its haunts. Before we reached the top, a quite unexpected cloud covered the hill and rain fell in bucketfuls. Fortunately we had umbrellas, but our boots were soaked through and we had much difficulty in negotiating various seams of clay, sometimes of a brilliant red, that we came across. Eventually we obtained shelter under a shed and waited. Later in the day we made a steep descent over slippery limestone rock to the nearest village of San Roberto, where the people were keeping the festa in orthodox fashion, with a band to play dance music, to which the young men danced, generally two at a time, followed by the young women by themselves and then the little girls. The "festa offerings" to be obtained were of the cheapest and commonest kind, but it was interesting to see how the natives enjoy themselves at such a trifling cost.

My ill-luck in April stuck to me until the 30th, when I walked up to Gravitelli, and heavy rain sent me back home at once.—J. PLATT BARRETT; Westcroft, South Road, Forest Hill, S.E.

(To be continued.)

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## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 12th, 1914.*—Mr. B. H. Smith, B.A., President, in the chair.—Mr. B. Williams, of East Finchley, and Professor Meldola, F.R.S., were elected members.—Mr. H. Rowland-Brown discussed the matter of Nature Reserves, and appealed for further financial aid and suggestions for the care of these areas.—Rev. G. Wheeler read a paper on "The Genus *Melitæa*," and exhibited many European species.—Mr. A. E. Gibbs exhibited his collection of the American species of the genus *Melitæa* with species of the allied genus *Phyciodes*.—Mr. Curwen, specimens of most European species of *Melitæa*.—Mr. J. Platt Barrett, series of Sicilian *M. athalia* and *M. didyma*.—Mr. Edward, species of *Phyciodes* and *Coatlantona*, from South and Central America.

*February 26th.*—The President in the chair.—There was a special exhibition of lantern-slides by members.—Mr. Tonge, various details of lepidopterous life-histories.—Mr. C. W. Williams, organisms obtained by using the Berlese apparatus, and details of *Coniopteryx* and *Aleyroides*, &c.—Mr. West, various species of *Collembola*, &c.—Mr. Colthrup, illustrating the resting position of lepidopterous imagines.—Mr. Frohawk, a series of *Anosia plexippus* bred from ova laid by a female sent alive to this country.—Mr. Main, for Mr. Sharp, of Eastbourne, a bred gynandromorph of *Eriogaster lanestris*, left



side male, right side female.—Mr. W. J. Kaye, the Syntomid *Diptilon halterate*, which is readily taken for a species of Diptera.—HY. J. TURNER, *Hon. Rep. Secretary*.

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—*March 4th, 1914*.—Mr. H. Horsfall read a paper by himself and Mr. W. F. Windle on the Macro-Lepidoptera of the Oldham district. He first of all referred to the geography of the district, which contains moorland, rocky hillsides, a manufacturing district, and an agricultural plain. Then he referred to the insects in detail, the records to which he had access comprising the last fifty years. It seems that there is some evidence to show that *Plusia bractea* was once not uncommon, though the actual records are few. A few insects were exhibited, including:—*Xylophasia monoglypha* (dark forms), *X. rurea* and var. *combusta*, *Hybernia defoliaria*, *H. marginaria*, *Phigalia pedaria* and var. *monacharia*, *Agrotis lucerneae*, &c. The tendency towards melanism is most noticeable in many species.—Mr. J. E. Cope made some introductory remarks on the Coleoptera, and explained his remarks on their structure by means of some beautiful dissections.—A. W. BOYD, M.A., *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquh Street, Liverpool, *January 19th, 1914*.—Mr. R. Wilding, President, in the chair.—A discussion upon "Varieties and Species recently added to the Local List of Lepidoptera" was opened by Mr. W. Mansbridge. Novelties were confined almost entirely to the Micro-Lepidoptera and to variation. Twenty-six species new to Lancashire and Cheshire since the last published list were enumerated, one of them *Scoparia vafra*, Mey., being new to science. The increasing tendency to melanism and spread of melanic forms was commented upon, instances being *Boarmia repandata* becoming more frequent at Delamere in its black form (var. *nigra*); *Fidonia atomaria*, from near Burnley and Chat Moss; *Tortrix costana*, from Liverpool and Burnley; he also mentioned that the black forms of *Aplecta nebulosa* did not appear to be increasing in relative numbers at Delamere; on the contrary, in 1913 the percentage was smaller than usual from wild larvæ.—Mr. S. P. Doudney exhibited a specimen of *Cherocampa celerio* captured at Prescot, and Mr. W. Mansbridge brought a specimen of *Catocala fraxini* having very dark, almost black, fore wings, bred from a Sussex female.

*February 16th*.—Mr. R. Wilding, President, in the chair.—This meeting was a joint one with the Manchester Entomological Society, who were invited to tea by the Council. A large number of exhibitions were made, including the following, *viz.*:—A small collection of insects from the Amazons, by Mr. C. H. Walker.—Prof. Newstead and Mr. Watson, of Manchester, made remarks upon this exhibit, describing the habits and life-history of the more noteworthy species. Mr. V. Coryton, of Manchester, exhibited a fine melanic specimen of *Plusia gamma*, as well as a bronzy form and the typical insect for comparison; also *Trochilium crabroniformis*, *Nola cuculatella*, *Eupithecia fraxinata*, and a short series of *Peronea variegana*, all from the Brooklands district of Cheshire.—Mr. R. Tait, Jr., full-fed larvæ of *Epunda lichenea*, found in the open in North Wales, on January



10th, many then found had already pupated; he also made some remarks upon the early date.—Mr. B. H. Crabtree showed varieties of *Abraxas grossulariata* as follows, viz.:—*lacticolor-radiata*, *lacticolor-cuneata*, *iochalcea*, *flavopalliata*, and *flavopalliata-cuneata*.—Mr. W. Mansbridge, a long series of *Fidonia atomaria* from the Burnley district, bred by forcing in a warm room in January, including many dark forms; also a series of *Odontopera bidentata* var. *nigra*, which emerged in January in a cold room.—Dr. P. F. Tinne, a series of *Cidaria reticulata* from Windermere.—Mr. R. Wilding, *Satyrus semele*, English and Irish forms; *Pieris napi* from Ireland, Kent, and the coast sand-hills; also *Melitæa artemis* from Ireland.—Mr. F. N. Pierce had on view the drawings for his forthcoming work "The Genitalia of the British Geometræ," as well as preparations under the microscope.—WM. MANSBRIDGE, *Hon. Sec.*

DERBYSHIRE ENTOMOLOGICAL SOCIETY.—The inaugural meeting of the above Society was held on March 7th, 1914, at Derwent House, Duffield Road, Derby, by the kindness of Dr. St. John. The Rev. R. C. Bindley (Vicar of Micklegate) was elected President for the ensuing year, and Dr. St. John, Treasurer. The Secretary is Mr. G. Hanson Sale, Littleover House, Littleover, Derby, who will be glad to forward particulars to naturalists interested. The object of the Society is the study of general entomology, with special reference to species occurring in Derbyshire. The following exhibits were made:—Mr. Geo. Pullen, a collection of Hymenoptera.—Dr. St. John, living larvæ of *Monacha* and *Plumigera*.—Mr. H. C. Hayward, a number of melanic forms of local species.—Mr. J. Douglas, a large number of varieties of *Amathes (Orthosia) lychnidis*.

## RECENT LITERATURE.

*Memoirs of the Queensland Museum.* Vol. i (Nov. 27, 1912) and vol. ii (Dec. 10, 1913). Brisbane.

AMONG papers of interest to entomologists in these volumes is the series on Australian Hymenoptera Chalcidoidæ, by A. A. Girault, parts i, ii, and iii of which are published in volume i (pp. 66-189); parts iv-vi, and Supplements to parts i-iii appear in volume ii (pp. 101-334). A number of new genera are characterised, and very many species are described as new to science. The families treated are—Trichogrammatidæ, Mymaridæ, Elasmidæ, Eulophidæ, Perilampidæ, and Pteromalidæ.

In another paper Alan P. Dodd describes some new genera and species of South Queensland Proctotrypoidæ (vol. ii, pp. 335-339).

There is also a short article entitled "Some Field Notes on Queensland Insects," by Henry Hacker (pp. 96-100).

OBITUARY.—We have to announce, with great regret, that Mr. G. B. CORBIN, of Ringwood, died on March 12th last. A further notice will appear in May.

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[No. 612

A MONOGRAPH OF THE GENUS *JOPPIDIUM*, WALSH.  
Family ICHNEUMONIDÆ : Subfamily CRYPTINÆ : Tribe CRYPTIDES.

By CLAUDE MORLEY, F.Z.S.

"THE species of this genus are slender in form, especially that of the male, the legs slender, the posterior pair unusually long; the antennæ of the female often thickened before the apex, somewhat as in *Joppa*; the wings ample, and in the Mexican species, so far as known, entirely blackish; the abdomen more slender than in *Cryptus*, the first segment being long and linear," says Cresson, who places them between *Cryptus* and *Phygadeuon* in 1873. As a matter of fact, it is extremely similar to *Acroricnus* in its produced mouth, and I fail to discover any pertinent structural distinction; if it be thought expedient to preserve Walsh's genus, its invariably infumate wings and western range will serve as sufficient characters. The American species are easily distinguished, and quite distinct *inter se*. But little synonymy has hitherto arisen.

A detailed and fairly good description of the genus is given, with an excellent figure of the front wing of *Ichneumon* sp. for comparison, by Walsh in his erection (Trans. Acad. Sc. St. Louis, iii. 1873, p. 69); but the author obviously had no idea of its systematic position, for he compares it with such diverse things as *Baryceros*, *Joppa*, *Helwigia* and *Euceros*, with none of which it is at all closely connected.

From the somewhat irregular method of sexual erection of his genus *Joppoceras* by Ashmead (Proc. Nat. Mus. U.S. 1900, pp. 39-40), one is led to suppose it founded upon a new and hitherto unpublished species, named in MS. *dubiosum* by Cresson, differing from the type of *Joppidium*—there misprinted *raficeps*, Walsh—solely in having the metathorax both strongly striate and bicarinate in place of unitranscarinate, as in the latter; for in both the metathoracic spiracles are elongate with wings black or infusate, and areolet both large and parallel-sided. As a matter of fact, I believe he simply wished to split off the second of the following species into a new genus, certainly upon insufficient characters.

## TABLE OF SPECIES.

- (14). 1. Wings unicolorous infumate, at most with cæruleous reflection.  
 (9). 2. Upper basal nervure strongly antefurcal.  
 (6). 3. Thorax and abdomen entirely black.  
 (5). 4. Antennæ orange with their apices alone infusate. . . . . 1. *rubriceps*, Cress.  
 (4). 5. Antennæ black with no more than a pale central band . . . . . 2. *dubiosum*, Cress.  
 (3). 6. Mesothorax entirely red.  
 (8). 7. Metathorax black and very strongly sculptured . . . . . 3. *ardens*, Cress.  
 (7). 8. Metathorax also red and discally glabrous . . . . . 4. *cæruleipenne*, Cam.  
 (2). 9. Upper basal nervure not postfurcal.  
 (13). 10. Frontal orbits not white; upper basal nervure continuous.  
 (12). 11. Thorax discally black; wings unicolorous . . . . . 5. *apicale*, Cress.  
 (11). 12. Thorax entirely ferrugineous; wings unicolorous . . . . . 6. *fuscipenne*, Brullé.  
 (10). 13. Frontal orbits white; upper basal nervure strongly postfurcal . . . . . 7. *bellicosum*, Hal.  
 (1). 14. Wings with flavidous streak at base of stigma and on hind stigma . . . . . 8. *annulicornæ*, Ashm.

## 1. JOPPIDIUM RUBRICEPS, Cress.

Trans. Amer. Ent. Soc. 1872, p. 160, male and female; *J. ruficeps*, Walsh, Trans. Acad. St. Louis, 1873, p. 70, female.

This is the typical species of the genus, and a single pair was captured in North America on umbelliferous flowers during July. I am not aware that it has been noticed since 1873, and greatly doubt the synonymy, suggested by Walsh, with *Banchus æquatus*, Say (Boston, Journ. Nat. Hist. 1836, p. 247; Leconte, Writ. Say, ii. p. 701). The typical male was acquired by the British Museum in 1873, and the female was possibly destroyed in the Chicago conflagration of 1871, at which time Cresson tells us Walsh's MS. was already completed; this male is from "Texas (Belfrage)," and was labelled by Fred. Smith "*Joppidium nebriceps* (sic), Cress." It is at once known from the remainder of the genus by its entirely black thorax and abdomen, and its bright orange-coloured antennæ with their apices alone slightly infusate; the description of Walsh's name appears to differ solely in its slightly darker flagellum.

## 2. JOPPIDIUM DUBIOSUM, Cress.

Proc. Acad. Philad. 1873, p. 138, male and female.

Sumichrast found both sexes at Cordova in Mexico; but it was unknown to Cameron when writing the Ichneumonidæ part of Biologia Centr.-Amer. of 1885. As its author remarks: "The female is closely allied to that of *rubriceps*, Walsh, but distinct

by the very different sculpture of the metathorax. The males of the two species are very distinct." This is a shining black insect with all the tibiæ and tarsi conspicuously flavous. In the National Collection are half a dozen examples, comprising both sexes, from Xucumanatlan in Guerrero at 7000 ft. in July, Teapa in Tabasco in March, and taken by Schumann about Atoyac in Vera Cruz.

### 3. JOPPIDIUM ARDENS, Cress.

Proc. Acad. Philad. 1873, p. 139, male and female; *J. ruficollæ*, Cam. Biologia, p. 210.

First described from Cordova; Isthmus of Tehautepec; but a very common species, and obviously the same as Cameron's *J. ruficollæ*, figured at Biol. pl. ix. fig. 16, female. Known by the constantly black meta- and red meso-thorax, the black hind tibiæ with their basally pale tarsi. Over sixty examples were found in Mexico at Chilpancingo at 4600 ft. in July, Atoyac in April, Xucumanatlan at 7000 ft., Dos Arroyos in Guerrero at 1000 ft. in September, R. Papagaio in Guerrero at 1200 ft. in October, Amula at 6000 ft. in August, Venta de Zopilote at 2800 ft. in October, Acaguiztla in Guerrero at 3500 ft. in October; Temex by Gaumer; Tierra Colorado; and by Champion at San Geronimo, whence is Cameron's type in the British Museum, in Guatemala, and San Joaquin in Vera Paz.

### 4. JOPPIDIUM CÆRULEIPENNE, Cam.

Biologia Centr.-Amer. 1885, Hym. i. p. 211, pl. ix, fig. 17, male and female.

Extremely similar to *J. fuscipenne*, Brullé, but quite certainly distinct in its larger size, broader wings with strong cærulescent reflection, black hind tarsi, distinctly antefurcal basal nervure, and especially in the glabrous and glittering metanotum. Apparently a rare species; the male, taken by Champion at David in Chiriqui (and figured in Biologia), is not in the National Collection, though the female type, found by Boucard in Panama, is there along with a male, labelled "Amérique meridionale," and correctly named by the late Rev. T. A. Marshall—probably ex coll. André—though the abdomen is mainly ferrugineous.

### 5. JOPPIDIUM APICALE, Cress.

Trans. Amer. Ent. Soc. 1872, p. 160, female.

"Quite distinct from *rubriceps* by the colour of the legs and abdomen"; the former are testaceous with their hind tibiæ and tarsi flavidous, the coxæ with hind femora and trochanters black; the latter is ferrugineous, basally nigrescent. One female in the British Museum was captured by Herbert H. Smith at



Atoyac in Vera Cruz during May, and has the metathorax transaciculate, not "deeply punctured," as Cresson describes it; the basal nervure is continuous. It was originally brought forward upon a single female collected in Comal Co.

#### 6. JOPPIDIUM FUSCIPENNE, Brullé.

*Cryptus fuscipennis*, Brullé, Nat. Hist. Ins. Hym. iv. 1846, p. 189, female; cf. Cam. Biologia Centr.-Amer. 1885, Hym. i. p. 211. *J. yucatanense*, Cam. lib. cit. p. 211, pl. ix. fig. 18, female. *J. donabilis*, Cress., Proc. Acad. Philad. 1873, p. 139, male and female.

No doubt can, I think, be experienced that Brullé's description refers to *J. donabile*, and it was placed in the present genus by Cameron in 1885; the metathorax is rather transaciculate than "rugueux," but the "deux chevrons parallèles" are obviously the two transcarinæ, which are often centrally incomplete. It is an abundant Mexican species, found by Sumichrast at Cordova; subsequently described from a single female as new by Cameron from Valladolid in Yucatan (this type differs from the usual form of *J. donabile* only in its paler—by no means whitish, as figured—flagellar base). I have examined eighty examples, among which the male much predominates, from Venta de Zopilote at 2800 ft. in October, Chilpancingo at 4600 ft. in July, Temex in northern Yucatan, Cuernavaca in Morelos in June, Acaguizotla at 3500 ft. in October, Guadalajara in Jalisco in July, and Dos Arroyos in Guerrero at 1000 ft. in September. This and *J. cæruleipenne* are the only Mexican species with entirely rufescent thorax and unicolorous wings.

#### 7. JOPPIDIUM BELLICOSUM, Hal.

*Cryptus bellicosus*, Hal., Trans. Linn. Soc. 1836, xvii. p. 318, female. *C. nitidipennis*, Brullé, Nat. Hist. Ins. Hym. iv. 1846, p. 188, female. *Ichneumon macrocercus*, Spin., Gay's Hist. fis. Chile Zool. vi. 1851, p. 484, male and female.

The above three authors record their species, which have not before been synonymised, respectively from the Straits of Magellan, Chili, and "Se halla en las provincias centrales, Santiago, &c." Dalla Torre misspells Spinola's specific name; and incorrectly associates *Cryptus bellosus*, Curt. (*Aritranis signatorius*, Fab.), noted at Proc. Ent. Soc. iv. 1845, p. lvii, with Haliday's species. This insect is very different from all the others of the present genus in its narrowly clear white internal orbits, and is probably worthy of generic rank in its slender and elongate antennæ, short metathorax, small areolet, postfurcal upper basal nervure, and tremendously elongate terebra; it is precluded from the genus *Cryptus* by the elongate cheeks and mandibles. The size varies considerably through the whole

structure, and, excepting the density of alar infumescence, the colours are very constant; I have seen examples varying from: body 14 and terebra 35 mm. in length, to others with body, 19 mm. and terebra fully 60 mm. in length. The National Collection is somewhat rich in this South American species:—Chili (Bartlett Calvert; in 1856 by T. Edmonds; and in 1875 by Edwyn C. Reed); Valdivia, Corral or Conal in 1898 (Cameron); South Chili, Maquehue, Temuco, January, 1906 (R. M. Middleton); Santiago in 1869 (Reed); Patagonia, Volcan del Lago Xanco, two in 1903 (Chubut); Terra del Fuego, Rio McClelland on December 30th, 1904, and Nose Peak on January 15th and 18th, 1905 (R. Crawshay); and Haliday's type, labelled "*Cryptus bellicosus*" by him, presented by the Linnean Society in 1863.

#### 8. JOPPIDIUM ANNULICORNE, Ashm.

Proc. Californ. Acad. v. 1895, p. 549, male.

I have not seen this Californian species.

### NOTES ON EUROPEAN HESPERIDS.

By W. G. SHELDON, F.E.S.

A YEAR or two ago, until the researches of Dr. Reverdin threw a flood of light on certain species in this group, those of us who were interested in the genus labelled our specimens with doubt and trembling, and described them, if we said anything about them in print, as examples of species which they almost invariably had no pretence to belong to. Consequently, reliable data for these species are at present non-existent, except those contained in Dr. Reverdin's papers on the subject in the Bulletin of the Geneva Society.

My friend Mr. A. L. Rayward has most kindly, recently, made preparations of all the doubtful specimens of the *alveus* group which I have met with in my various wanderings in different parts of Europe during the past twelve years, and as the species those specimens belong to can now be with certainty determined, I append a list of localities in which they were found, in the case of each species, and the actual dates on which the specimens were taken:—

*Hesperia alveus*.—I have specimens from Simplon Kulm, July 24th and 25th, 1903. Berisal, July 22nd and 23rd, 1903. The Laquinthal, July 26th, 1903.

*H. serratulae*.—Buda Pest, May 22nd, 1910. Berisal, July 7th, 1902. Albarracin, June 18th and 19th, 1913.

*H. onopordi*.—Albarracin, May 26th to June 6th, 1913. Ronda, April 19th, 1908. Hyères, April 11th, 1904, and May 13th, 1905. Digne, July 13th, 1904.

*H. armoricanus*.—Hyères, May 18th, 1905.

*H. carlinæ*.—Abries (Hautes Alpes), July 20th to 22nd, 1904. Berisal, July 22nd and 23rd, 1903.

*H. cirsii*.—Albarracin, July 27th to August 2nd, 1905.

*H. bellieri*.—Beauvezer (Basses Alpes), August 1st and 2nd, 1906.

Mr. Rayward also made preparations of all my *Hesperia malvæ* and *H. malvoides*, and these come out as follows:—

*Hesperia malvæ*.—Aigle, June 26th, 1902. Buda Pest, May 30th, 1909, and May 11th, 1910. Saeterstoen, Norway, June 4th, 1912.

*Hesperia malvoides*.—Riffelalp, Zermatt, July 4th, 1902. Martigny, June 27th to 29th, 1902. Aigle, July 12th, 1902. Albarracin, June 6th to 19th, 1913. Guethary, near Biarritz, May 23rd, 1908, and June 23rd to 26th, 1913. Hyères, April 13th, 1904, and May 13th to 18th, 1905.

It will be noted that I have specimens of both these species from Aigle. The examples of *H. malvæ* were taken in the fields at the back of the Grand Hotel, and those of *H. malvoides* somewhere along the Sepey Road. I cannot at this length of time remember the exact spot where they occurred, but on the day on which they were taken I walked up as far as Vuargny.

Youlgreave, South Croydon: March 21st, 1914.

## A BEE RESEMBLING A WASP.

By T. D. A. COCKERELL.

AUSTRALIA has long been known as the home of the curious genus *Hylæoides*, bees presenting the most extraordinary resemblance to Eumenid wasps. I have now to record a bee, just received from the Queensland Museum, which looks at first sight like some Crabronid wasp; so much so that I could hardly believe, until I had examined it with a lens, that it was really a bee.

### *Euryglossa crabronica*, sp. n.

♀. Length, 11 mm.; expanse,  $14\frac{1}{2}$ , the wings unusually short; robust, black, marked with yellow, with very scanty greyish-white pubescence; head broad, face and front shining; palpi short; blade of maxilla rounded, about as long as wide; mandibles bidentate, dull yellowish basally, ferruginous apically; labrum black; clypeus bright lemon-yellow, the lower border narrowly black, the yellow area depressed in middle above (following clypeal margin) and constricted at sides, the whole having the outline of a low-crowned soft hat with the brim turned down; supraclypeal area shining, with very sparse strong punctures; flagellum bright ferruginous beneath; thorax wholly black except the tubercles, which are partly yellow; mesothorax and scutellum shining, well punctured; area of metathorax



smooth and polished, the extreme base in middle rough; tegulæ piceous; wings dusky, nervures and stigma dark fuscous; lower side of first s. m. strongly arched; first r. n. meeting first t. c.; legs black with white hair, the femora polished; anterior and middle knees yellow; anterior tibiæ light yellowish-ferruginous in front; tarsi ferruginous apically; abdomen dull black, segments 2 to 4 with very large transversely elongated yellow triangular or cuneiform patches basally on each side; fifth segment with a pair of quadrate chrome yellow patches, separated by a black band; apex of fifth segment with black hair.

*Hab.* Brisbane, Queensland, October 17th, 1913 (Hacker; Queensl. Mus., 105). A very remarkable species, quite unlike any previously known.

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## BRITISH ORTHOPTERA IN 1913.

By W. J. LUCAS, B.A., F.E.S.

JUDGING by results, the season of 1913 was a very ordinary one as regards the British Orthoptera. On June 23rd Mr. P. Richards sent me from Seabrook, a small village between Hythe and Sandgate, in Kent, a living female nymph of a large Locustid, presumably *Phasgonura viridissima*. It was captured at Seabrook on June 21st, and Mr. Richards reports that there were a good number in the place. He fed it on flies, which it ate greedily. On the other hand, Mr. C. W. Bracken, writing July 21st, says of another Locustid, *Pholidoptera griseo-aptera* (= *T. cinereus*), that he fed it on lettuce. Many of our Locustid grasshoppers are often found to be carnivorous, but how far this habit is natural to them does not seem to be well ascertained, and reports on food that they take most readily would be useful, for it seems likely that some of them at any rate may be good friends to the gardener or agriculturist.

In the New Forest, on July 5th or 6th, I met with my first mature grasshopper, a male of the Acridian species *Chorthippus parallelus*. On July 30th the large bog-loving Acridian *Mecostethus grossus* was mature in the New Forest, two males being captured on that date near Holm Hill.

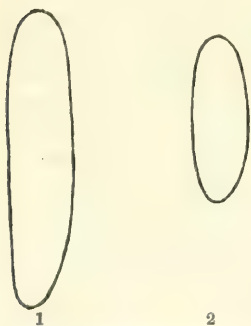
Mr. S. E. Brock has forwarded me a few dates from Linlithgowshire. He found *Omocestus viridulus* stridulating at Drumshoreland and Riccarton Hills on July 20th, and *C. parallelus* was heard at the former locality on July 27th. On the next day *Gomphocerus maculatus* was stridulating at Craigton. A small colony of the last species was found on the south slope of Cockleroy (altitude about 800 ft.), on September 21st. The "courtship" of the same species was observed at Craigton, on August 8th (*vide antea*, p. 104).

In the New Forest, from July 26th to September 8th, the



following species were met with:—*M. grossus*, *O. viridulus*, *C. parallelus*, *Stauroderus bicolor*, *G. maculatus*, *O. rufipes*, *Tetrix bipunctatus*, *Nemobius sylvestris*, *P. griseo-aptera*, and *Metrioptera brachyptera*.

On September 9th a visit was paid to Bookham Common, Surrey, to get *Gomphocerus rufus*, this being the only locality in which I have found it. A spot of no great extent by the side of one of the string of ponds near Bookham Station yielded specimens, and it could be seen nowhere else. We took eighteen examples. Even at this late date several were still but nymphs, and two of these, together with three imagines, were brought home alive. On the morning of September 14th one of the nymphs was found to have cast its skin, thereby becoming an imago (female), and, judging by its appearance, the change had occurred but a short time before the imago was noticed. Those brought home alive fed on grass, as did others of the British Truxalidæ that I have kept in captivity. Thirteen that were put in a laurel-bottle, with perhaps a spot or two of benzine, were of a brilliant crimson colour when removed a day or two later, and this tint to some extent they retained when dry. An egg is



1. Egg of *Gomphocerus rufus*  
2. Egg of *Diastrammena narmorata*  
(Both  $\times 10$ )

illustrated in fig. 1 to a scale ten times natural size. Its length is 4 mm., and width in position drawn about .9 mm. If this may be called a lateral view, the dorsal width is about 1 mm. It is somewhat rounder at the upper end as drawn, and the lower end turns very slightly to the left. The surface is a little wrinkled transversely. The examples used were extracted from a dead female and put in spirit and water, so I am not able to say anything about the natural colour.

Mr. B. S. Williams sent me a living female of *Leptophyes punctatissima*, which he took from a fence in a wood at East Finchley, N., on September 16th.

Somewhat late records are:—The little earwig (*Labia minor*), a male and two females taken by Mr. J. R. le B. Tomlin, on October 2nd, at Glemsford in Suffolk; *S. bicolor* (one very dark) and *M. brachyptera*, taken by Mr. E. Step, on the occasion of the Fungus Foray of the South London Entomological and Natural History Society, at Oxshott, on October 4th; one *Stenobothrus lineatus*, a local species, taken as nymph, by Mr. T. A. Chapman at Buckland, Surrey, on October 18th, which became an imago on October 21st; *G. rufus*, a female taken by Mr. Chapman at Buckland on October 31st.

Considerable interest attaches to the capture, in Kent, of a

large Locustid, *Diestrammena marmorata*, de Haan (fig. 3), which Mr. M. Burr brought up to the Entomological Society for exhibition on October 1st. It appears that Rev. E. N. Bloomfield received three specimens that had been taken on September 23rd, October 19th, and November 12th, in an outhouse at St. Leonard's. It seems clear that the origin of these insects was to be found in Relfe's Nursery at St. Leonard's, whence



FIG. 3.—*Diestrammena marmorata*, de Haan, ♀, nat. size. W. J. Lucas, photo.

Mr. Bloomfield received six more specimens, they being not uncommon in a fern-house. *D. marmorata* is a native of Japan, but has been taken under conditions very similar to those at St. Leonard's in several places on the Continent. Nor are these the only British examples; for, strange to say, I received on the same day (October 1st) some decomposing fragments of Locustids from Mr. Harwood, of Colchester. They came from a wall covered with "virgin cork," at Sir Ernest Cassel's residence at Ipswich; but whether the wall was indoors or not was not mentioned. Though considerably decomposed, there was but little doubt about their belonging to the species under notice. *D. marmorata* is a large insect with very long appendages of all kinds, and is very spider-like in appearance and movements. Its colouring is a mixture of different tints of bright brown. I

possess another female of good size, which was taken in Kew Gardens four or five years ago. Since this species appears to be chiefly carnivorous in its habits, it is probably more useful than otherwise to the gardener (see above). The egg (fig. 2) is small for so large a grasshopper, its length being about 2.2 mm. and width about .8 mm. It is nearly, but not quite, a cylinder with somewhat hemispherical ends, and the surface is slightly, but regularly, roughened. Of the colour I cannot speak, as the eggs examined were extracted from the body of a dead female.

Kingston-on-Thames: March, 1914.

## SOME DORSET HEMIPTERA-HETEROPTERA.

BY F. H. HAINES, D.P.H., M.R.C.S., L.R.C.P.

THE following list of Hemiptera-Heteroptera found by me during the last few years in this neighbourhood may be of interest:—*Thyreocoris scarabæoides*, L. Once in numbers. *Podops inuncta*, F. West Lulworth, common on the chalk. *Schirus luctuosus*, M. & R. On the coast. *Gnathoconus albo-marginatus*, Goeze. Two, May, 1913, at West Lulworth. *Palomena prasina*, L., *Piezodorus lituratus*, F., *Pentatoma rufipes*, L., *Picromerus bidens*, L., *Rhacognathus punctatus*, L., *Zicrona cærulea*, L. Common on the heathlands. *Acanthosoma hæmorrhoidale*, L., *A. interstinctum*, L., *Elasmostethus griseus*, L. The females may be commonly found with their young, in June, on *Betula*, near the outskirts of woods. *Enoplops scapha*, F. Four, last August and September, at Ringstead. *Syromastes marginatus*, L., *Coreus denticulatus*, Scop., *Stenocephalus agilis*, Scop. Very common on the coast. *Corizus maculatus*, Fieb. One at Tadnoll on Sept. 10th, 1908. *Neides tipularius*, L. One in my garden, May 2nd, 1908. *Nysius lineatus*, Cost. One at Holme, near Wareham, on August 29th, 1912. *Cymus glandicolor*, Hahn, *C. claviculus*, Fall., *Ischnorhynchus geminatus*, Fieb. Very common on the heaths. *Heterogaster urticæ*, F., *Rhyparochromus prætextatus*, H. S., *R. chiragra*, F., *Ischnocoris angustulus*, Boh., *Macrodera micropterum*, Curt., *Stygnus pedestris*, Fall., *Aphanus pini*, L., *Drymus sylvaticus*, F., *D. piceus*, Flor. One at East Stoke on Oct. 1st, 1908. *Notochilus contractus*, H. S., *Scolopostethus affinis*, Schill., *S. thomsoni*, Reut., *S. decoratus*, Hahn, *Serenthia læta*, Fall., *Campylostira verna*, Fall., *Dictyonota tricornis*, Schr., *Monanthia humuli*, F., *Aradus depressus*, F., *Hydrometra stagnorum*, L., *Velia currens*, F., *Gerris lacustris*, L., *Coranus subapterus*, De G., *Nabis lativentris*, Boh., *N. major*, Cost., *N. flavomarginatus*, Scholtz., *N. limbatus*, Dahlb., *N. lineatus*, Dahlb., *N. rugosus*, L., *N. ericetorum*, Scholtz., *Salda*

*littoralis*, L., *S. saltatoria*, L., *S. pilosella*, Thoms., *S. cincta*, H. S., *S. cocksi*, Curt., *Lytocoris campestris*, F., *Anthocoris nemoralis*, F., *A. nemorum*, L., *Triphleps minuta*, L., *Microphysa elegantula*, Baer., *Pithanus maerkeli*, H. S., *Miris calcaratus*, Fall., *M. lævigatus*, L., *M. holsatus*, F., *Leptopterna ferrugata*, Fall., *L. dolabrata*, L., *Lopus gothicus*, L., *Phytocoris reuteri*, Saund., *P. ulmi*, L., *Calocoris ochromelas*, Gmel., *C. roseo-maculatus*, De G., *C. bipunctatus*, F., *C. lineolatus*, Goeze, *C. ticinensis*, Mey., marshy places, August and September. *C. infusus*, H. S., *Stenotus binotatus*, F., *Lygus cervinus*, H. S., *L. pastinacæ*, Fall., *L. kalmii*, L., *Liocoris tripustulatus*, F., *Rhopalotomus ater*, L., *Halticus apterus*, L., *Campyloneura virgula*, H. S., *Cyllocoris histrionicus*, L., *C. flavonotatus*, Boh., *Orthotylus tenellus*, Fall., *O. ochrotrichus*, D. & S., *O. ericetorum*, Fall., *Heterotoma merioptera*, Scop., *Macrotylus paykulli*, Mey., *Harpocera thoracica*, Fall., common on oaks. *Phylus palliceps*, Fieb., *P. melanocephalus*, L., *P. coryli*, L., *Psallus ambiguus*, Fall., *P. betuleti*, Fall., *P. variabilis*, Fall., *P. quercus*, Kb., *P. fallenii*, Reut., *P. varians*, H. S., *P. roseus*, F., *Plagiognathus arbustorum*, F., *Nepa cinerea*, L., *Notonecta glauca*, L., *Corixa geoffroyi*, Leach, *C. hieroglyphica*, Duf., *C. sahlbergi*, Fieb., *C. mæsta*, Fieb.

This district is varied in character. The chalk downs and other formations of the coast are partly replaced inland by heaths of Bagshot and Reading sands. Sometimes I fancy the Bagshot more prolific than the Reading beds. Areas of London Clay occur, on which is wood. Here and there is marshland, and there are margins of fenland by the Frome. I have not specially searched for these insects, or, doubtless, many more would have been met with.

An almost bare list suffices, as most species occurred under usual conditions.

Brookside, Winfrith, Dorset.

## AN ACCOUNT OF AN ENTOMOLOGICAL TRIP TO CORSICA.

BY GERARD H. GURNEY, F.E.S.

THE following notes of a trip which I made last summer to Corsica are in no way records of varieties captured or an account of a profusion of butterflies seen; for, as a matter of fact, in many respects the time I spent in that delightful and romantic island was, entomologically speaking, rather a failure. The reasons for this were, that in the first place it was an extremely late season, at any rate in the mountains, many insects not appearing until a fortnight or more after one had a right to



expect them, and then only in very small numbers. The greater part of May and early June had been very wet and cold, and at Vizzavona I was told there had been more rain and snow during the early part of the summer than had been known for at least ten years. An old French gentleman who lives at Ajaccio told me that the backwardness of plant life generally (he was something of a botanist) was phenomenal, and that the excessive cold and wet which they had been having had done considerable damage to fruit trees and crops; and so of course in the same way insects suffered. Except with one or two exceptions butterflies were never plentiful; and even when we went down from Vizzavona to Corte, two thousand feet lower, we still found the same condition of things prevailing and heard the same story: that never had there been such a wet, cold summer. Consequently, when we arrived in the island towards the end of June many of our first days resulted in seeing very little, and we had literally to wait for the butterflies to come out, which they chose to do very slowly indeed; and when we had to leave on July 17th our "bag" was by no means a large one, though I am bound to say we were able to see and obtain good series of the majority of the interesting Corsican specialities. Before going to Corsica I had spent a few days collecting in the forests near Laon, in Northern France. Here on June 19th *Dryas paphia* was emerging and becoming common; in Corsica, hundreds of miles further south, I did not see *D. paphia* until July 5th, when at Corte, in the Restonica Gorge, which is very warm and sheltered, this species was then only just commencing, and was not out at Vizzavona a week later, where most collectors have generally found it abundant in the second week of July. However, if butterflies were not plentiful, Corsica itself is so beautiful and full of interest that one must indeed be without resources if one cannot fill up the time in other ways. We found the natives charming and always pleasant to talk to; while with its splendid mountain scenery every corner is a perfect picture for an artist; and of course the flora of Corsica is well known for its variety and interest. I had as companion my friend Mr. Robert Trapper-Lomax, who, although at starting somewhat of a novice in matters entomological, soon became an adept with the net, and quickly began to talk with the greatest glibness of "*elisa*" and "*hospiton*," though his great wish to secure a specimen of the latter butterfly was never realized. Leaving Marseilles at 4 o'clock in the afternoon, we slowly steamed out to sea under a cloudless sky, the statue on the church of "Notre Dame de la Garde" standing up above the tower like a figure of living gold, illuminated by the rays of the hot afternoon sun. Next morning, however, when we arrived at Ajaccio at 5 a.m. a drizzling rain was falling, and the hills surrounding one of the most beautiful bays in Europe were

shrouded in vapour and mist; but in spite of the wet it was very hot when we got on shore, with a close, almost tropical atmosphere. We engaged rooms at the Hôtel de France in the middle of the town, as the much better and more comfortable Grand Hotel is closed at this time of year. By 10 o'clock the rain had stopped and the sun was shining brilliantly, quickly drying up the sopping vegetation, and we were on the war-path, and once again experiencing that feeling of intense excitement which always fills one when, after perchance a year's interlude, one starts for one's first walk with a butterfly net in a perfectly new country, where one imagines one is at once going to see every sort of rarity, and where every insect that comes along is eagerly captured and carefully examined before being either released or consigned to a pill-box.

Quickly walking through the town in a north-westerly direction, we came out on to some rough ground, partly cultivated terraces and small fields; but everything was frightfully burnt up and insects were not common. A small form of *Polyommatus icarus* was rather frequent, fresh specimens of probably a second or third brood; and flying about amongst the burnt-up herbage was *P. astrarche*, also of rather small size but with the red spots large and brilliantly coloured; these might be referred to as var. *calida*. Working round by the back of some villa gardens, a few *Pieris brassicæ* were noticed, but further along, at the foot of some dry hills, we found *Epinephele ida* to be rather common; they were quite fresh, and are, I think, somewhat larger than my Spanish examples. Here also Mr. Lomax secured a fine specimen of *Tarucus telicanus*, which with two or three rather ragged *Lampides bœticus* were haunting the flowers of a small wild "pea" (?) which rambléd over the dry stony ground, but which further along, where a tiny spring welled up and where the vegetation in consequence became a little more luxurious, grew into quite a fine plant. A good many butterflies were attracted to this spot—*Pararge egeria*, fresh *Colias edusa*, *Issoria lathonia*, one or two *Leptidia sinapis*, and a single lovely *Pyrameis cardui*.

The dry hillsides were in many places covered with heliocrysum in full blossom, making fine patches of golden colour; these were attractive to a fair large form of *Epinephele jurtina* var. *hispulla*, both sexes being in good order. Here also were *P. icarus*, more *E. ida*, and numerous *E. tithonus*, with a few very darkly-coloured *Chrysophanus phlœas* var. *eleus*; and as we were walking back to Ajaccio by the roadside, and flying literally amongst the thick white dust *Pararge megæra* var. *tigelius* was not infrequent, though generally shabby individuals.

The following morning, as there did not seem to be anything to detain us in Ajaccio, we left for Vizzavona, a journey which takes some four hours or more, but which is always interesting

because of the gradual ascent from the hot low plains and hills, fragrant with the scent of endless sweet-smelling herbs, through the dense "maquis," which is the Corsican name for the thick, in many places almost impenetrable, bush which covers all the hillsides up to about 2000 ft., and which is composed of arbutus, Mediterranean heath, and myrtle scrub, leaving which the line goes through woods of splendid chestnut trees, with picturesque villages perched on the tops of rocky hills, or lying hidden in sheltered valleys, till it reaches the pine forests and eventually stops at the station of Vizzavona.

Here we were very soon comfortably settled in the very clean and nice Grand Hotel, which in spite of its name is a sufficiently simple establishment, but perfectly comfortable for a lengthened stay. Vizzavona is right on the edge of the magnificent pine and beech forest, and consists of the hotel, post-office, two or three small villas, and half a dozen cottages; but it is a convenient centre, and most of the Corsican butterfly specialities may be taken within a short distance. The afternoon we arrived we went for a short walk in the direction of Tattone, a small hamlet some three miles further on. It was very cool and dull, with only occasional gleams of sun, and we did not see a *single* insect of *any* description, which was rather a damper to one's entomological enthusiasm. The heliocrysum, which was so conspicuous a feature at Ajaccio, covering the ground with golden blossom, was at this elevation not in flower.

Next morning was brilliantly fine, and we started off betimes, through the forest, past the Monte d'Oro hotel, which is forty minutes' walk from Vizzavona, and on to the Col de Vergio; on the way up we saw very little, an occasional *L. sinapis* and a single fine *Pyrameis atalanta* sitting on a plant in a patch of sunlight which forced its way through the thick pine trees.

However, when we emerged from the forest on to the mountain side matters mended somewhat, and it was not long before I had taken one of the Corsican specialities, viz. *Cænonympha corinna*. Near the Monte d'Oro hotel, in the very black-coloured Corsican nettles, were many larvæ of *Aglais urticæ* var. *ichneusa* in all stages of growth. I collected a good number of these, but only took the smallest specimens, as I knew if I took full-fed ones I should probably breed out about ninety per cent. of ichneumons; those I kept fed up and emerged nearly a month later, when I had got back to England, all fine large examples of this interesting insular form of *urticæ*, not a single one being ichneumonised. On the "Nek" itself *Lycæna argus* (*ægon*) var. *corsica* was flying about quite commonly amongst the bracken and small juniper bushes, which here thickly cover the top of the Pass on either side of the road; they were quite fresh, but the beautifully marked females were rather scarce.

Passing over the "Nek" and descending a little the other



side, *C. corinna* turned up frequently; curiously enough many were quite worn, giving the appearance of having been on the wing for some time. Others again in the same locality were evidently freshly emerged—rich brilliant orange, the males with intense black tips to the wings; it is a very pretty little butterfly when quite fresh. Here also were a few *P. brassicæ*, which deserve no special mention as they were quite typical. Climbing up to the old fort, which stands so picturesquely guarding the Pass, we found a few very dark *C. phlæas* var. *cleus*; and worn *P. megæra* var. *tigellus*, and *L. argus* (*ægon*) var. *corsica*, were plentiful, while an interesting object was the Corsican sharp-headed Lizard, *Lacerta oxycephala*—a finely-marked black and green form, which was very common on the rocks round the Tour.

Undoubtedly much the best ground in the vicinity of Vizzavona is the meadows and rough land in the direction of, and beyond, the little village of Tattone; to reach this one has a walk of nearly three miles, either by the winding road or, more quickly, along the railway line. Here, where the very picturesque village school is built, is some excellent ground, and our second morning, and very many others as well, were spent collecting and sketching hereabouts. On the left of the road is much rough bracken-covered ground, with open spaces covered with flowers and luxuriant grass, rendered more luxuriant still by the little streams of water which have been cut to irrigate the land and which flowed in all directions. Here *L. argus* (*ægon*) var. *corsica* was in the greatest profusion, both sexes abundant and in beautiful condition, and it was pretty to see them sitting with expanded wings on the bracken. Two specimens of *Lycæna argyrognomon* var. *bellieri* were netted here, but I have no note of taking this species anywhere else

(To be continued.)

## NOTES AND OBSERVATIONS.

WICKEN FEN.—The National Trust for Places of Historic Interest or Natural Beauty have now made arrangements for the appointment of a watcher for their property in Sedge Fen, Wicken, Cambridgeshire. Applications for permission to visit this property should be addressed to A. H. Evans, Esq., Secretary of the Local Committee, 9, Harvey Road, Cambridge, or to S. H. Hamer, Esq., Secretary of the National Trust, 25, Victoria Street, London, S.W.

HIBERNATION OF *Pyrameis atalanta*.—As there is a controversy regarding the hibernation of *Pyrameis atalanta*, it may be of interest to know that a specimen was seen at Cripplestytle, near Fordingbridge, on Thursday, April 16th.—A. S. CORBET; Bournemouth.



PROLONGED PUPAL DURATION IN *ERIOGASTER LANESTRIS*.—From larvæ taken on June 19th, 1909, I obtained in 1910 seven moths, six males and one female emerging on February 27th, and one female on March 8th: no moths appeared in 1911, but in 1912 five males emerged, two on February 21st and three two days later. There was no further emergence in 1913, but on the 2nd inst. a perfect male emerged. I have still three pupæ remaining, but whether living or not I am unable to say, the cocoons being intact. The date of the last emergence would seem to be unusually late.—LLOYD CHADWICK, 7, Northgate Street, Warwick, April 19th, 1914.

MACROGLOSSA STELLATARUM.—I saw a specimen of *M. stellatarum* this morning flying over a rhododendron which is just bursting into flower. This seems to be an unusually early appearance, in view of the rainy and comparatively sunless March which we have experienced.—H. V. PLUM; Kelly College, Tavistock, April 3rd, 1914.

DESCRIPTION OF THE FULL-FED LARVA OF *THECLA SPINI*.—Whilst at Albarracin in June last summer I beat sundry Theclid larvæ from two species of *Rhamnus*, one of which was *R. licyoides*; these eventually produced specimens of *T. spini*, and as descriptions of the larvæ of all Continental European Rhopalocera hardly exist, I am induced to publish the following details of the full-fed larva:—Length 15 mm.; breadth 4 mm. Head jet black and shining; second segment much narrower than those following, and narrower in front than in the rear; third segment is the full width of the larva (4 mm.). Colour of all segments except first (the head) light grass green. On the front of third segment commence two subdorsal stripes, greenish white in colour, these stripes are interrupted at the front and rear of each segment and they extend through ten segments. The spiracular stripes are the same colour as those on the subdorsal area, and extend from the third to the anal segment, both inclusive. Between subdorsal and spiracular stripes is an inconspicuous series of diagonal stripes. The ventral area is bluish green with claspers of grass green. The spiracles are inconspicuous and of a somewhat lighter green than the surroundings.—W. G. SHELDON; Youlgreave, South Croydon, April 26th, 1914.

BUTTERFLY COLLECTING IN SICILY AND CALABRIA IN 1912 AND 1913.—I was persuaded to stay at Messina for the first week in May, and on the first I climbed Monte Cicei (2000 ft.); on the 3rd I walked up to Gravitelli, and on the 6th I visited the low hills at the extreme north-east point of Sicily overlooking the Faro, and though the weather was fine and hot, the rain had evidently retarded the appearance of the summer butterflies. I reached Forest Hill on May 10th with a very small "bag," which to my disappointment did not contain a single fresh species to add to my list. Then followed the wet summer in England.

In the spring of 1913 circumstances delayed my leaving England for Sicily until May 14th. Again I started in brilliant sunshine, again I left the finest weather in England. Crossing the Channel clouds gathered, and at Dieppe there was a heavy thunderstorm, and rain fell as I journeyed across France and entered Italy. In

order to escape arriving at Messina at the inconvenient hour of 2 a.m., I broke my journey on the morning of May 16th at Cajanella (pronounced Canella), a roadside station fifty miles north of Naples. The village itself was very picturesque, nestling at the foot of an isolated hill between higher hills. This hill was crowned with a ruined castle and a roofless chapel, which reminded me of Corfe Castle, Dorset, and I found there was a grand view (as at Corfe) from the top across the plain. On the plain, farmhouses sheltered by trees and bushes were dotted about, and nightingales were in full song in broad day at each of them, while near the station hundreds of house-martins had their nests in the eaves of an immense old building, probably a former monastery. The main road was good, but the lanes were very muddy, and in places quite impassable owing to recent heavy rains, and as a consequence butterflies were very scarce, *icarus* and *rapæ* being most in evidence. When I was nearly stuck in the mud, a youth came to my assistance and acted as guide until I left, and would take no tip! He was quite satisfied with the opportunity to pick up a little English, his ambition being to emigrate to America shortly. Reaching Messina at 8.30 a.m. on March 31st, I was in time for a good breakfast and able to spend a full day enjoying the delightful atmosphere of Sicily, this being, I was told, the first really nice day for several weeks past.

Next day a picnic was arranged for me at the Campo Inglese, where Lord Nelson formed his camp over one hundred years ago, but from experience I recognise that picnics, like field meetings, are seldom successful from a collector's point of view. Before reaching the top of the hill I separated from my party to climb a spur of Monte Cicci, intending to rejoin them at the camp. The only butterflies on the wing were whites, and while I was on the steep slope I noticed a cloud of large whites crossing the valley below, moving towards the west. There must have been thousands of them, and a few stragglers came up the hill in my direction, males of *Pieris brassica*, in good condition. I learnt afterwards that a couple of friends of mine saw the cloud passing over the torrent bed at La Scala, two or three miles further west, and captured some specimens. With regard to the migration of butterflies I was told in 1910 by a native of Cucuraci, the nearest village to the Campo Inglese, that the people there look for an annual invasion of white butterflies about May 20th, but he could not say where they came from. Across the Straits in Calabria, not many miles distant, there is a very extensive plain formed by the River Messina and its tributary, the Marepotamo, which is a possible source of origin, and I should like to explore that district at a future date. When I joined my friends at the Campo Inglese, I found four thousand soldiers in camp, many of them being engaged in drill, which was interesting to watch.

On May 19th I hurried off to spend three or four days at Randazzo, the railway communication being so slow that I did not arrive until sunset. At my hotel I met an entomologist from Vienna, Herr Carl Hosfer, and he, with his wife, asked to be allowed to join me next day. The forenoon was bright and sunny,

and with our combined three nets we captured fifteen specimens of *Euchloë damone* in excellent condition, before rain practically put an end to collecting for the day. We each took a specimen of *Lycæna alciphron* (var. *gordius*), and amongst other species were *Polyommatus baton*, *Aporia cratægi*, *Pieris daphidice*, *Thais polyxena* (quite *passé*), *Euchloë belia* (var. *ansonina*), *cardamines*, &c., and a small form of *zygæna*. We got shelter from the rain and enjoyed a cup of tea which Frau Hosfer was able to make by the aid of a spirit lamp carried with them, and water obtained at the adjoining farmhouse.

Next day (May 21st) we agreed to take different directions. We got up early, and before 9 a.m. *damone* was flying in the sun. Later on clouds began to gather, and about eleven o'clock specimens of *Aporia cratægi* became quite common. Apparently I was in a swarm, they were on all sides of me, moving steadily in one direction—westward. I captured about a score—all males—not one female, in order to get a series of the Sicilian form, which has been named *augusta*, and I had to hurry up, for before noon a thunderstorm broke. Then I had to run for shelter from the downpour, and fortunately reached a cave excavated by the labourers for that purpose. The storm lasted about an hour, and then of course *Aporia cratægi* had disappeared, and the herbage being soaked, it was necessary to keep to a pathway. After lunch I followed a mule track up the mountain in the endeavour to reach the highest zone of vegetation, where only *Sedum* grows, but after a three hours' climb, I had to be satisfied with finding out that the various trees which form a wood, very conspicuous from below, are not pines as I expected, but beech, oak, white poplar, and a kind of berberry. Making a hurried return to Randazzo, I had a narrow escape of a night out, for at dusk a dense cloud, damp as well, enveloped the district and hid Randazzo from view, though I had almost reached the railway station, where an engine was whistling continuously. In the dark I missed a sudden turning in the broad cinder path and got on a dangerous rocky slope, where I thought it prudent to remain still. Fortunately, after a couple of hours the cloud lifted a little, and after some careful searching I found a narrow track which led to some huts. The occupants had retired to bed and at first refused to open their only door, but at the third hut I found a Good Samaritan willing to direct me. The following day was nice and sunny, but we found the heavy rain had apparently diminished the number of butterflies. Herr Hosfer and myself were both desirous to visit Palermo, and we agreed to meet there. I returned to Messina and he continued his tour *viâ* Girgenti.

From May 24th until I left Messina on June 14th there was an entire absence of rain, and a heat-wave gradually increased in intensity. I found Messina hot and dusty, and Palermo still hotter. By arrangement I met Herr Hosfer and his wife, on Monte Ciuccio, near Palermo, on May 26th, early. It is a steep rocky slope without any shelter. *Melanargia pherusa* was flying about in abundance, but we failed to capture a single specimen worth keeping. The heat, combined with the slippery slope, fairly beat us, and we had to retire to the valley below for shelter. In the valley I caught a newly



emerged specimen of *galatea* flying most erratically, and a few blues and skippers.

I decided to return to Messina from Palermo by easy stages along the north coast, and finding that a motor-omnibus runs daily from Termini Imerese (twenty-three miles from Palermo) inland to Nicosia, &c., I caught an early train (5.45) with a view to getting a ride to the foot of one of the Madonie Mountains. The motor was waiting at the station, filled already with passengers, so my plan failed. Then I decided to climb the hill at the back of Termini Imerese, and somehow was wrongly directed, so that I found myself in a labyrinth of paths in the vineyards, and in consequence of the intense heat in the middle of the day I never reached the uncultivated top region at all. I saw numerous specimens of *podalirius*, *machaon*, *edusa*, *cleopatra* (male and female), *daphidice*, *ausonia*, *cardamines*, and other species common to the vineyard district, but nothing novel. About five o'clock I struck the mule track which I ought to have taken going out, and was able to get back to the town in a very short time. Here there is a magnificent hotel in connection with the Baths (Hôtel de Bagnes), with a grand marble staircase, fine bedrooms with ante-rooms for washing, table d'hôte, and every comfort at moderate cost (I made a note of this).

The following morning (May 28th) I caught the early train, and arrived at San Stefano di Camastra (fifty miles) at 7.30 a.m. I had planned to take the motor-omnibus to Mistrella, six miles distant, and return on foot. Again there was not a seat vacant. Again I never reached the top of the hill owing to the intense heat. The industry of the town is the manufacture of earthenware jars of all sizes and shapes; also bricks and tiles; while the flowers on the waste places adjoining the works were very attractive to the butterflies named yesterday, and I also took *Polyommatus astrarche*, *Spilothyrus altheæ* and *Hesperia sao*. Burnet moths were also plentiful. Hotel accommodation and meals were quite Sicilian, and certainly inexpensive.

San Stefano lies west of the Forest of Caronia, whence it obtains brushwood for its kilns; the next station is Caronia itself. On May 29th I reached Caronia station early, hoping to get a glimpse of the forest. The village (or rather big town of 20,000 inhabitants) is four miles up the mountain, and on reaching it I found there was no decent place to sleep at, and the only food I could get was fried eggs, cold beans, and bread, at a dirty wine-shop, so I gave up the idea of the forest and returned to the station in time to catch the evening train to Sant' Agatha, the next town. On my way down in the afternoon I struck a wide provincial road, where I captured fresh *galatea*, several *Vanessa c-album*, also *V. egea*, and a fresh specimen of *Argynnis cleodoxa*. I reached Sant' Agatha after dark, and there the sleeping accommodation and food were of a very primitive and inexpensive character. I returned to Messina on May 30th, and I have not quite given up the idea of a visit to the Forest of Caronia and a trip in the Sicilian long-distance motor-omnibuses, which are not run for profit, but for the convenience of the residents.

I found the heat at Messina very trying, and several picnic parties we made up in June proved entomological failures, as it was



quite necessary to take shelter in the middle of the day, and generally butterflies go to rest early. On June 6th I ventured on a long excursion to Scylla in Calabria, and reached the station quite early. The locality for *M. arge* being on the plateau 2000 ft. above the station, when I reached there I could only spare a few minutes to search for it, and I think I was too late, as its place was occupied by *galatea*.

Nearer home *galatea* var. *procida* was well out at Gravitelli on June 8th, and on June 9th the Sicilian form of *japygia* was plentiful on a particular slope at Cattarati. This species flies later in the evening than most butterflies, and on this occasion had for its companion the showy *Melitæa didyma*, which, as the sun begins to disappear behind the hill, has the habit of settling on the top of the long grass with its wings wide open, exactly resembling a crimson flower. It was sufficiently abundant to create a veritable living flower garden, a sight never to be forgotten.

Another locality for *japygia* is at the foot of Monte Scudari (4000 ft. high), and on June 11th I trained to Scaletta and walked to Itala, a highly picturesque village. The wind was blowing a gale, and in the open it was impossible to get any butterflies. By following a rocky path up the bed of the stream for a considerable distance I reached a sheltered spot and there found *japygia* and some other species in full force, amongst them being *Argynnis pandora* and quite ordinary *galatea*. The heat in the narrow gorge was terrific.

My last excursion was with an entomological friend to Monte Cicci on June 13th. On our way up we discovered a fresh locality at the back of a fort with flowers galore and the common *Vanessæ* in abundance; also *Hipparchia circe*, the latter not easy to catch, owing to the breeze. Subsequently I found a specimen of *H. hermione* amongst them, and my friend was able afterwards to capture more. It was rather too late for the early brood of blues, but we secured several specimens of *semiargus*, also *argus* (one) and *teli-canus* (one), and amongst the skippers *Hesperia comma* (one) turned up. Both *galatea* and *japygia* were present, and apparently we were too early for *statilinus* and *niobe* var. *eris*, which were both seen but not captured. The heat, however, proved too much for my friend, and we returned early.

Next day I left for England, and found Naples, Rome, Paris, and London, alike suffering from the heat-wave.—J. PLATT BARRETT; Westcroft, South Road, Forest Hill, S.E.

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## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 4th, 1914.*—Mr. G. T. Bethune-Baker, President, in the chair.—Miss Maude Lina West Cleghorn, 57, Ballygunge, Circular Road, Calcutta, and Mr. William John Forsham, M.R.C.S., L.R.C.P., The Villa, Bubwith, Selby, Yorkshire, were elected Fellows of the Society.—The President announced that he had nominated Dr. H. Eltringham, the Hon. N. Charles Rothschild, and the Rev. G. Wheeler, as Vice-

Presidents for the present Session.—Mr. B. H. Smith exhibited specimens of *Prodenia littoralis*, bred from larvæ found feeding on bananas at Weymouth.—Mr. C. B. Williams, a specimen of the genus *Acerentomon* of the order Protura, taken from moss in the New Forest, Hampshire. He also drew the attention of the Society to the new order Zoraptera just described by Silvestri.—Mr. Donisthorpe, specimens of the ants *Cecophylla smaragdina*, F., from Ceylon, and *H. virescens*, F., from North Queensland. These ants use their larvæ to spin threads and fasten the leaves of their nests together.—Professor Poulton, a collection of Algerian Diptera and other insects associated with them, made by Dr. Adalbert Seitz, F.E.S. The specimens were chiefly taken at Batna (about 1300 metres) in July, 1913.—The following papers were read:—"On the Egg-laying of *Trichiosoma*," by T. A. Chapman, M.D., F.Z.S., F.E.S. "A Remarkable New Genus and Species of Odonata of the Legion *Podagrion*, Sél., from North Queensland," by Kenneth J. Morton, F.E.S. "Lepidoptera-Heterocera from S. E. Brazil," by E. Dukinfield-Jones, F.Z.S., F.E.S. "The Myrmecophilous *Aphides* of Britain," by Professor F. V. Theobald, M.A., F.E.S.

Wednesday, March 4th.—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Messrs. Wm. J. von Monté Pendlebury, Broadlands, Shrewsbury, and Keble College, Oxford; Robert Veitch, 7, Queen's Crescent, Edinburgh, and Francis Cardew Woodforde, B.A., Market Drayton, Salop, were elected Fellows of the Society.—Mr. H. Donisthorpe and Mr. W. C. Crawley exhibited a number of polymorphic forms in ants, illustrated by a chart, and read notes.—Dr. T. A. Chapman, a male and female imago of *Agriades thersites*, alive, bred from the egg; also two last-stage larvæ.—Mr. H. Main, a gynandromorphic specimen of *Eriogaster lanestris*, right side female, left side male, bred last year at Eastbourne.—Mr. O. E. Janson, a specimen which he believed to be the female of *Goliathus wisei*, Heath, hitherto unknown; also specimens of *G. kirki*, Gray, in which the white markings were very perfectly preserved.—Dr. F. A. Dixey, at the desire of Mr. J. C. Hawkshaw, F.E.S., a cocoon of *Lyonetia clerkella*, L., spun up on a cherry leaf. Mr. Hawkshaw suggested that the fine silken web attached to the leaf on each side of the supporting strands, and guy lines by means of which the cocoon is slung up like a hammock, served as a protection against ants.—Mr. Champion, on behalf of Mr. E. W. Morse, of Leeds, the second British specimen of the genus *Eudectus*, probably a variety of *E. whitei*, Sharp, from Ingleborough, Yorks., and a pair of *Cedemera virescens*, L., from Symond's Yat, Hereford.—Mr. Ernest Green, a Coccid with double anterior limb, and read notes.—Mr. L. W. Newman, a fine female *Lasiocampa ilicifolia* taken on the wing at Cannock Chase, by Mr. G. B. Oliver, on May 25th, 1913. Mr. Newman stated that the larvæ in captivity took readily to aspen.—Mr. A. W. Mera, two specimens of *Cidaria suffumata*, of an unusual form, from East Devon, received from Rev. J. W. Metcalfe, who takes this form in damp woods and finds it not entirely confined to one wood.—Professor Poulton stated that he had just received, from Mr. E. E. Platt, of Durban, the male and female parents—both of the *wahlbergi* form—caught *in coitu*, and with their

large family of about two hundred *mima* and *wahlbergi* in about equal numbers. These results were quite unexpected.—The following paper was read:—"A Revision of the Central American Chauliognathinae (Fam. Telephoridae) based on the Genital Armature of the Males," by G. C. Champion, A.L.S., F.Z.S., F.E.S.—GEO. WHEELER, M.A., *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 12th.*—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—Mr. J. C. Fryer, Northumberland Avenue, was elected a member.—Mr. W. J. Kaye exhibited two quite distinct species of *Heliconius*—*H. hydara* and *H. amaryllis* var. *euryades*—of almost exactly the same facies, with microscopic slides of the genitalia.—Mr. Newman, *Gastropacha ilicifolia*, male, taken at Cannock Chase, May 25th, 1913, by Mr. G. B. Oliver.—Mr. Tonge, nest of the North American hornet, *Vespa maculata*, from Massachusetts, with several imagines.—Mr. Step, photographs of *Aleurodes* (*Aleyrodidae*), a family allied to the *Coccidæ*, and gave notes on the habits of the insects. The rest of the exhibits were microscopical.—Dr. Chapman, the androconia of *Agriades thersites*; spring brood larger, much like those of *P. escheri*; summer brood much like those of *P. icarus*.—Mr. West, imagines of *Aleurodes* (*Aleyrodidae*).—Mr. Adkin, armatures of *Ptycholoma lecheana*, cocoon structure of *Anthrocera filipendule* and *Saturnia pavonia*.—Mr. C. B. Williams, British species of the order Protura.—Mr. Coxhead, galls, with larvæ and pupæ, of *Cecidomyia saliciperda*.—Mr. Ashdown, small brilliant and metallic species of Coleoptera and Hemiptera, including *Hispa atra*, larva of *Jalla dumosa*, &c., with the Swiss *Centhorrhynchus horridus*.—Mr. Noad Clark, androconial scales of *P. brassicæ*, Diatoms, Desmids, and botanical structures.

*March 26th, 1914.*—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—Mr. Edwards exhibited a large coleopteron, *Archon centaurus*, found dead at Blackheath, and also a number of Lepidoptera from Burmah, including *Chalcusia venosa* and *C. zetica*.—Mr. Tonge, a long series of *Colias edusa* taken near Reigate in 1877-78, the years of great abundance.—Mr. H. J. Turner, *C. edusa* from Dawlish, &c., including female var. *helice* and bred examples of intermediate coloration.—Mr. A. E. Gibbs, *C. edusa*, with local forms from many European localities, with allied species from the Eastern Palearctic area and from the Nearctic region.—Mr. B. Adkin, a large number of *C. edusa*, including many specimens of intermediate coloration.—Mr. Joy, a very long series of bred specimens of *C. edusa*, all of large size, many females with small or no spots in the marginal bands.—Mr. Dunster, *C. edusa*, taken along the south coast of England during the past three years.—Mr. Frohawk, very long series of *C. edusa* and female var. *helice*, showing almost complete gradation in ground from pure white to rich orange, including the rare shades of lemon colour and aberrations with black suffusion to the discoidal (fore wing), with black hind wings, with drab marginal borders, and a female measuring 67 mm.—Mr. R. Adkin, a long series of British *C. edusa*, and read a paper entitled "*Colias edusa* in Britain," deal-



ing in turn with Nomenclature, History in Britain, the Theory of its Occurrence, Probable Lines of Migration and Immigration, Local Habits, Variation and Aberration, Reasons of Irregular Abundance beyond the confines of its area of Natural Distribution, &c. A considerable discussion took place.

April 9th.—Mr. R. Adkin in the chair.—Mr. C. P. Emmett was elected a member.—Mr. R. Adkin exhibited three *Dasychira fascelina*, one with the usual black transverse lines largely yellow, and another with the black markings intensified with absence of the yellow freckling.—Mr. Edwards, several very conspicuous and beautiful Heterocera from Burmah, including *Argina argus*, *Euchromia formosa*, &c.—Mr. Sich, specimens of *Lita melanella*, first discovered in England by the late Mr. Boyd in 1858. They were from Weymouth.—Mr. H. J. Turner, a long series of *Erebica pronœ* from the Austrian Tyrol and Switzerland, and read notes on the variation, both local and aberrant, and the distribution of the species.—Mr. West, Greenwich, several drawers of the Society's collection of British Lepidoptera, to show the additions made in the Pyrales and Tortrices by the donations from Mr. Dawson.—Mr. Platt Barrett, a series of *Coccyx strobilella* bred from spruce cones collected at West Wickham some weeks ago.—HY. J. TURNER, *Hon. Rep. Sec.*

## RECENT LITERATURE.

1. *The Life of the Spider*. By J. H. FABRE. London: Hodder & Stoughton.
2. *The Life of the Fly*. With which are interspersed some chapters of Autobiography. By J. H. FABRE. London: Hodder & Stoughton.

ENGLISH readers should owe a debt of gratitude to Mr. Alexander Teixeira de Mattos for the admirable translation which he has given in these two volumes of a number of J. H. Fabre's most delightful "souvenirs," and to the publishers, also, thanks. The books are light to handle, and so well printed as to be a joy to read. Although there are no illustrations, this is scarcely a matter for regret. Fabre is so proficient with the pen, and so perfect an artist in words, that no descriptive writer could need pictorial illustration less. And yet we should like to have seen a picture of the author himself in the second of these volumes, where, under the title of 'The Life of the Fly,' we can learn almost as much about his own life as we can about that of the fly. His early struggles; the enthusiasm, the patience and perseverance which carried him through all his difficulties; the nature of his ancestors and the kind of schooling he had, and how much, or how little, these could account for that passionate love of the insect, and that spirit of observation which gained for him from Darwin the title of "inimitable observer." All these, and other matters relating to his life, are so modestly and charmingly



told in the autobiographical chapters scattered through the volume, that it is a pity more prominence was not given to the fact in the title, which, however attractive it may be to the dipterologist, does not sufficiently make known the delightful field which it covers, or appeal so strongly to the general reader. Fabre is not an entomologist in the limited sense which that word now implies, and so we have him writing as intimately about the life-history and habits of spiders of all sorts in the first of these volumes as he does about those of flies in the second. To this volume there is a preface by M. Maurice Maeterlinck, which does full justice to Fabre's qualities of style and imagination, and contributes not a little to a proper appreciation of him as a philosopher and man of science.

C. J. G.

## OBITUARY.

GEORGE BENTLEY CORBIN.

READERS of the 'Entomologist' will learn with regret of the death of Mr. George Bentley Corbin, which took place at Ringwood on March 12th last. Born in Ringwood in 1841, he developed an early love of Nature, in the study of which he showed considerable ability. He was a keen and observant entomologist. About 1866 and for several years he conducted 'The Amateur Naturalist'—a manuscript magazine, and his contributions were mainly on insect-life.

He wrote the entomological chapter in the second edition of 'The New Forest Handbook,' published by Phillips, in 1876, and for many years contributed articles upon the subject to 'Science Gossip' and similar journals. At one time he was a frequent contributor to the 'Entomologist,' and among his later contributions to that journal are—" *Deiopea pulchella* in Hampshire" (1893); " *Emydia cribrum*: A Reminiscence" (1897); "Aberration of *Zygæna filipendule* and *Z. trifolii* near Ringwood" (1897); "Early hibernation of *Vanessa urtica*" (1905); and " *Plusia moneta* in the New Forest" (1907).

By the tragic death of his wife, who was killed in the railway accident at Downton, in 1884, he received a severe shock. The news of her death caused partial paralysis of the left side. This unfortunately put an end to his active interest in entomology, and deprived him of the fullest enjoyment of the life with Nature that had hitherto been his. He was an invalid for the rest of his days, and yet he lived a full life and overcame his incapacity. His spirit was uninjured and he was of a sunny disposition, as his writings show. He had a wide circle of friends and correspondents, including many eminent entomologists. He was a deeply devout man, and to those who enjoyed his friendship his memory will remain fragrant and kindly.

F. V. B.

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## NEW SPECIES OF ARCTIADÆ AND NOCTUIDÆ FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

### NOLINÆ.

#### *Nola fuscimarginalis*, sp. n.

Fore wings whitish becoming dark fuscous on outer area beyond the wavy, double, postmedian line; costa edged with brown expanding into a blotch before the postmedial line. Hind wings fuscous. Under side fuscous.

Expanse, 20 millim.

Collection number, 243.

One male specimen from Garambi, November, 1904.

This species comes near *N. distributa*, Walk.

### LITHOSIANÆ.

#### *Asura albidorsalis*, sp. n.

♂. Head and thorax whitish grey, abdomen rather darker. Fore wings blackish with a twice interrupted white patch on dorsal area, this extends from the base of the wing almost to tornus; postmedial band white, narrow, wavy; subterminal band whitish, wavy, diffuse towards apex and tornus. Hind wings whitish. Under side whitish clouded with blackish on fore wings; traces of a blackish transverse band about middle of costal area on hind wings.

♀. Similar to the male but the band on the fore wings is much broader, and encloses some spots of the ground colour.

Expanse, ♂ 32 millim., ♀ 33-36 millim.

Collection number, 1253.

One male from Arizan (7300 ft.), August, 1908; and three females from Rantaizan (7500 ft.), May, 1909.

Allied to *A. umbrosa*, Hampson.

#### *Eugoa sinuata*, sp. n.

Fore wings white with blackish lines; antemedial line not continued to dorsum, curved, projected inwards on costal area to a dot representing subbasal line on the costa; postmedial line commencing in a black triangle on the costa, sinuous, angled above the dorsum; subterminal line undulated, originating in a black costal triangle; two black dots at end of cell. Hind wings, and fringes of fore wings,

whitish with faint fuscous tinge. Under side whitish suffused with fuscous especially on fore wings.

Expanse, 32 millim.

Collection number, 1797.

One female specimen (minus head and abdomen) from Rantaizan (7500 ft.), May, 1909.

*Parasiccia nebulosa*, sp. n.

Fore wings whitish with faint ochreous tinge, finely sprinkled with black; a black patch on costal half of basal area, its outer edge irregular; antemedial line black, wavy, commencing in a black spot on the costa, interrupted above dorsum; postmedial line blackish, wavy, traversing black spots; subterminal line black, interrupted widely so below costa; a terminal series of linear black spots, and two black spots in the cell, the outer one largest. Hind wings whitish, fuscous tinged, a blackish lunule at end of cell. Under side of fore wings fuscous, of hind wings same as on upper side.

Expanse, 30 millim.

Collection number, 1265.

One male specimen from Arizan (7300 ft.), August, 1908.

Seems to come nearest to *P. maculifascia*, Moore.

AGROTINÆ.

*Noctua taiwana*, sp. n.

Head and thorax purplish brown, patagia rather darker; abdomen fuscous, terminal segment fringed with ochreous hairs. Fore wings dark purplish brown; antemedial and postmedial lines black, double, the former deeply indented above dorsum; subterminal line ochreous, undulated, inwardly edged with black; terminal area beyond the line with clusters of bluish scales on the veins and at costal extremity of subterminal line; orbicular stigma of the ground colour, ringed with black; reniform outlined in black and partly filled up with ochreous. Hind wings fuscous. Under side dark fuscous, all the wings have a darker discoidal mark and postmedial line.

Expanse, 40 millim.

Collection number, 1502b.

Two male specimens from Arizan (7300 ft.), August, 1908.

The cotype, not in such perfect condition as the specimen described, is browner in colour, and the markings on the terminal area are absent.

HADENINÆ.

*Hadena variegata*, sp. n.

Head and thorax brown, collar and patagia paler edged; antennæ ciliated. Fore wings brown clouded and mottled with darker and lighter brown; subbasal line black extending only to median nervure under which it runs to the incurved, black, antemedial line; postmedial line black, incurved, angled about middle; stigmata of the paler ground colour, outer edges still paler and pinkish tinged, reniform outlined in black, its upper part extending almost to costa,

a black cloud in lower part; beyond the reniform the veins are marked with black and there are black streaks between the veins before termen; fringes black between the veins, pale brown at ends of the veins. Hind wings white-brown powdered with darker, venation and discoidal spot black; fringes brown, paler tips. Under side pale brown clouded with blackish on disc of fore wings; a black discoidal spot and an indistinct postmedial line (dotted with black on veins) on hind wings.

Expanse, 40 millim.

Collection number, 1757.

One male specimen from Rantaizan, May, 1909.

*Stretchia acronyctoides*, sp. n.

♂. Head grey, palpi brown, antennæ serrate; thorax grey, streaked with grey on the sides; abdomen brown. Fore wings grey clouded and suffused with brownish, and powdered with whitish especially on the dorsal area; transverse markings not distinct, but there are traces of a blackish, serrated, postmedial line, a short black streak from the base under median nervure, another, in line with it, extends to the termen; a black linear mark on middle of dorsum, and black dashes between the veins on terminal area, those between veins 4 and 6 most in evidence; orbicular and reniform stigmata united, edged above with black; some black dots on the costa above the stigmata. Hind wings brownish grey, discoidal dot black. Under side brownish, black discoidal dot on all wings.

♀. Similar to the male but larger.

Expanse, ♂ 38 millim., ♀ 41 millim.

Collection number, 1682.

A male specimen from Arizan, May, 1908, and a female from Rantaizan, May, 1909.

Allied to *Stretchia saxea*, Leech.

*Eriopyga conspecta*, sp. n.

♂. Head and front of thorax brownish grey, rest of thorax whitish with faint brown tinge; palpi dark brown, third joint paler; abdomen brownish grey, hind segments darker, anal tuft yellowish. Fore wings white transversely clouded with grey on the outer half; a reddish brown mark on costa towards base, and another, also on the costa, just beyond the middle; the first mark broadly margined with black on its inner and lower edges, and, except on costa, narrowly on its inner edge; the second mark has a small black spot on each side of it on the costa, one on its inner edge, and a large one below the lower outer edge of which is produced; a black mark on the costa before apex with a few reddish brown scales before it, and a row of black dots on the termen, the latter placed between the veins. Hind wings blackish with traces of darker discoidal mark and transverse line. Fringes of all the wings white. Under side whitish tinged with brown on the fore wings and on costal area of the hind wings; a cluster of blackish clouds beyond middle of the fore wings; the hind wings have black discoidal spot and postmedial line, and the costal area is freckled with black.

Expanse, 30 millim.



Collection number, 1441.

A male specimen from Arizan (7300 ft.), August 18th, 1908.

*Cirphis bipuncta*, sp. n.

♀. Head whitish, palpi and antennæ pale brownish; thorax whitish mixed with pale brownish; abdomen whitish. Fore wings pale brown streaked with darker brown between the veins on the terminal area; median nervure white; two black dots in the cell, and a series of black points on termen; fringes of the darker brown shade. Hind wings white, a series of black points on termen. Under side of fore wings whitish suffused with brown on costal and terminal areas, a dusky shade under median nervure; hind wings as on upper side.

Expanse, 15 millim.

Collection number, 135.

One female specimen from Takou (200 ft.), August, 1904.

Near *C. polemusa*, Swinhoe.

ACRONYCTINÆ.

*Craniophora picata*, sp. n.

♂. Head grey, palpi black, grey at tips; thorax grey with black line on lower edge, collar marked with black; abdomen pale grey. Fore wings blackish with white patches towards the base, around the orbicular stigma, and on apical third of the wings; costa marked with grey, three white dots towards apex; antemedial and medial lines black, double, wavy, the medial apparently merged in the antemedial below the orbicular stigma; postmedial line black, double, wavy, curved round outer edge of the apical white patch, thence slightly oblique to the dorsum; subterminal line white, edged with dark grey, preceded on the costa by a quadrate blackish spot, intersected above middle and again before dorsum by blackish marks; orbicular and reniform stigmata fairly distinct, both pretty much of the ground colour, the latter partly and the former entirely outlined in white; a pale patch at base of dorsum with some deep orange scales on its upper edge; fringes dark grey chequered with white and marked with black. Hind wings whitish, the termen broadly suffused with smoky grey, a dusky discoidal spot and traces of a postmedial band; fringes chequered with smoky grey. Under side whitish, clouded with blackish on disc of fore wings; hind wings with bar from costa to the cell, a discoidal spot, and a spotted postmedial line, all blackish.

Expanse, 44 millim.

Collection number, 1764.

A male specimen from Rantaizan, May 14th, 1909.

This species seems closely allied to *C. ligustri*, Schiff.

*Chytonix variegata*, sp. n.

♂. Fore wings brownish grey, clouded with darker brown; sub-basal line black, oblique, not reaching dorsum; antemedial line black, oblique, bluntly angled above dorsum; postmedial line black, ex-

curved from costa to vein 4, thence oblique to dorsum: a white dot adjoining postmedial under vein 2, and a blackish diffuse streak from white dot to antemedial line; orbicular and reniform stigmata pale with dark centres; two short black streaks between veins 1 and 4; fringes dark grey, paler marked at ends of the veins, a black line at their base interrupted by the veins. Hind wings whitish powdered with brownish, densely on terminal fourth; discoidal lunule and postmedial line dusky; fringes pale, traversed by a dark central line. Under side whitish, sprinkled, and on fore wings clouded, with brownish; all the wings have a blackish discoidal mark and a post-medial line.

Expanse, 34 millim.

Collection number, 1742.

One male specimen from Rantaizan, May 9th, 1909.

*Chytonix variegata albidisca*, ab. n.

Differs from the type in having a large white patch on central area of fore wings extending from postmedial almost to antemedial line, it encloses the stigmata and unites with the typical white dot.

Expanse, 35 millim.

Collection number, 1743.

One male specimen from Rantaizan, May 10th, 1909.

*C. variegata* is closely allied to *C. albonotata*, Staud.

*Chytonix olivacea*, sp. n.

♂. Head and thorax dark grey, black mixed, antennæ ciliated; abdomen pale grey, whitish at base and on last segments. Fore wings pale olivaceous grey clouded with darker, costa marked with black; subbasal line black inwardly edged with white, nearly straight but indented below costa and above dorsum; antemedial and postmedial lines black, both wavy, the former double and angled above dorsum, the latter outwardly edged with white; subterminal line pale, undulated; reniform stigma outlined in white; fringes variegated with white, preceded by a series of black lunules. Hind wings whitish powdered with dark grey; discoidal spot blackish, traces of a dusky postmedial line; fringes paler. Under side whitish, disc of the fore wings suffused with blackish; discoidal mark and post-medial line on the hind wings blackish.

Expanse, 38 millim.

Collection number, 1753.

One male specimen from Rantaizan, May, 1909.

*Euplexia albirena*, sp. n.

♀. Head pale brown darker mixed, thorax dark brown mixed with blackish; abdomen brownish, the sides and crests darker. Fore wings purplish grey; subbasal line ochreous, indistinct except towards the costa, where it is inwardly edged with black, some black marks beyond the indistinct lower half; antemedial and postmedial lines ochreous edged with black, the enclosed space below the cell rather darker than the ground colour; subterminal line ochreous, wavy; orbicular stigma, which is preceded and followed by a black quadrate

spot, is faintly outlined in ochreous and extends to the black outlined claviform stigma; reniform stigma white, its outer side straight, some brownish dots at each extremity; a white spot on the costa above the reniform and four white dots nearer the apex; beyond the reniform is a brownish clouded ochreous patch, outwardly limited by the postmedial line; on the costal area between the postmedial and subterminal line is a transverse white streak followed by a black one; black lunules alternating with ochreous dots on termen; fringes blackish, ochreous at base. Hind wings fuscous with dusky discoidal spot and two lines beyond, both lines edged externally with white on vein 2. Under side fuscous; all the wings have a discoidal mark and two transverse lines, the mark on fore wings and the outer line on hind wings are white.

Expanse, 38 millim.

Collection number, 1750.

Two female specimens from Rantaizan, May, 1909.

This species come near *E. albonota*, Hampson.

*Laphygma connexa*, sp. n.

♂. Head brown, palpi brown grey mixed; thorax grey, edge of collar paler; antennæ ciliated. Fore wings grey clouded with blackish; subbasal and antemedial lines indistinct, white edged with black, the subbasal only traceable on the costa, the antemedial interrupted below the costa and at dorsum; postmedial line white inwardly edged with black, sinuous, interrupted at the veins; subterminal line white, double, almost parallel with the termen, preceded and followed by black marks; orbicular and reniform stigmata white, grey centred, lower ends united by white streak along median nervure; fringes grey marked with white at ends of veins. Hind wings silky white. Under side silky white, the fore wings suffused with blackish on the disc; fringes as on upper side.

♀. Similar to the male but larger; the markings less clearly defined.

Expanse, ♂ 22 millim., ♀ 30 millim.

Collection number, 1403.

One example of each sex from Kanshirei; the male captured on November 10th, 1909, and the female in the previous month.

Allied to *Laphygma apertura*, Walk.

*Micromonodes? ochreipuncta*, sp. n.

♀. Head pale grey, palpi blackish; thorax and abdomen grey. Fore wings whitish grey, basal two-thirds suffused and clouded with darker; subbasal and antemedial lines blackish, not clearly defined; postmedial line whitish edged on each side with dark grey, sinuous; subterminal line whitish, angled before middle and above dorsum; orbicular and reniform stigmata indistinct, connected by a black bar; claviform stigma represented by a pale ochreous round spot, outlined in black; fringes grey mixed with black, preceded by a black line on termen. Hind wings grey, fringes paler. Under side grey, costal and terminal areas of fore wings sprinkled with whitish scales; hind

wings rather paler than fore wings; discoidal spot and postmedial line black but not distinct.

Expanse, 26 millim.

Collection number, 242 c.

A female specimen from Rantaizan, May 14th, 1909.

*Archanara punctivena*, sp. n.

♂. Head and thorax black sparsly mixed with ochreous; abdomen brownish, paler at base. Fore wings black-brown, dotted with white on the veins; an ochreous streak from the base passes through the reniform stigma and broadens out beyond it, some ochreous scales above the streak; antemedial line indicated by black dots; postmedial line black, wavy, inwardly oblique from vein 4 to dorsum; reniform stigma of the ground colour, its lower half partly outlined in white; fringes rather paler, grey mixed, preceded by a black line. Hind wings whitish with a faint dusky suffusion, traces of a dusky postmedial line. Under side of fore wings leaden grey with dusky discoidal spot and transverse line beyond: of hind wings whitish powdered with brownish on costal area, discoidal spot and line beyond blackish.

♀. Similar to the male but rather browner in colour and with more ochreous above the streak; the white outline of lower half of reniform stigma less distinct. Hind wings whiter.

Expanse, ♂ 25 millim., ♀ 30-32 millim.

Collection number, 620.

A male specimen from Kanshirei, November 13th, 1908, and two females from the same locality, August 13th and 26th, 1908.

ERASTRIANÆ.

*Oruza albigutta*, sp. n.

♂. Head and palpi black; thorax brown, paler in front; abdomen missing; fore wings brown, finely irrorated with grey, ochreous tinged on central area especially on basal half; antemedial and postmedial lines formed of white dots, the antemedial indistinct towards costa, the postmedial double excurved from costa to middle thence incurved to dorsum; medial line black, angled below cell and near dorsum; subterminal line pale, irregular, area beyond suffused with dark brown; fringes dark mixed with pale brown, preceded by a series of black outlined white dots. Hind wings brown, pale on costal area; discoidal mark white, linear, inwardly edged with blackish; postmedial line represented by double series of white dots, absent on costal area; subterminal line ochreous brown, diffuse towards costa, maculate towards dorsum: fringes as on fore wings. Under side white-brown, clouded and suffused with darker; traces of transverse lines, a pale spot at costal end of the postmedial line on forewings.

Expanse, 20 millim.

Collection number, 1388.

A male specimen from Kanshirei, April 17th, 1908.



*Hyposada albicosta*, sp. n.

♀. Head and thorax cinnamon brown, the latter marked with white behind collar; abdomen cinnamon brown, edges of segments white. Fore wings cinnamon brown, costa white with four black dots before apex; a black-ringed white spot at outer end of the cell; postmedial line blackish, slightly excurved below the costa, thence oblique to dorsum; subterminal and terminal lines represented by series of black dots. Hind wings cinnamon brown, discoidal spot black; postmedial line and black dots on terminal area as on fore wings. Fringes of all the wings pale. Under side whitish suffused with fuscous.

Expanse, 22–24 millim.

Collection number, 551.

Two female specimens from Kanshirei, one taken April 29th, the other August 16th, 1905.

*Lithacodia postvittata*, sp. n.

♂. Head and palpi brown, the latter marked with darker; thorax brown marked with darker, tips of collar and patagia whitish; tarsi pale brown, barred in front with blackish; antennæ ciliated. Fore wings brown clouded with darker, a white dot at base of costa; antemedial line black, inwardly pale edged, curved round orbicular stigma, angled below; postmedial line black outwardly pale edged, obtusely angled below costa; subterminal line pale, undulated, indistinct towards dorsum; the space between postmedial and subterminal lines, except on costal area, pale, suffused with greyish; orbicular and reniform stigmata pale, dark outlined; a black line from base of the wing to subterminal line passes through the cell; fringes brown faintly pale chequered, preceded by pale edged black lunules. Hind wings fuscous, discoidal mark darker; fringes rather paler than those of fore wings, traversed near their base by a dark line. Under side of fore wings fuscous, paler on costa; discoidal mark blackish, postmedial line pale and rather broad on the costa; hind wings whitish powdered with fuscous except on dorsal area; discoidal spot and wavy postmedial line blackish.

♀. Similar to the male but the pale edging of transverse lines rather broader on costa.

Expanse, ♂ 26 millim., ♀ 30 millim.

Collection number, 622.

Two male specimens and one female from Kanshirei. The males were obtained in June, 1906, and April, 1909; the female in May, 1907.

This species comes near *L. cœnia*, Swinhoe.

*Eustrotia bipartita*, sp. n.

♂. Head pale brown mixed with darker, palpi dark brown, the third joint and part of second paler; thorax pale brown, front darker marked; abdomen pale brown darker mixed. Fore wings pale brown on basal half, suffused with darker on outer half; subbasal line dark brown, originating in a linear spot on the costa, not traceable below middle of the wing; antemedial line dusky,

double, slightly wavy, elbowed below middle; postmedial line dusky, double, irregular; a dark triangular mark, partly outlined in black, on costa; traces of a black medial line set in a brownish cloud below triangle; subterminal line blackish, undulated, dentate below costa, preceded on costa by a conspicuous black mark; slender black lunules on termen, fringes dark. Hind wings fuscous with traces of a darker discoidal mark. Under side whitish powdered with brown except on the dorsal areas; a blackish discoidal mark on each wing, and traces of a dusky postmedial line on the hind wings.

Expanse, 20 millim.

Collection number, 1387.

A male specimen from Kanshirei obtained April 29th, 1908.

Appears to come near *E. isomera*, Hampson.

#### SARROTHRIPINÆ.

##### *Nanaguna sordida*, sp. n.

Head white, palpi pale brown; thorax pale brown flecked with paler. Fore wings pale brown clouded with darker on medial and terminal areas; antemedial line blackish, indented below costa and before termen; postmedial line elbowed beyond end of cell thence gently incurved to dorsum, white with black inner edge, most distinct towards dorsum; reniform stigma pale brown enclosing blackish lunule; a black line on termen; fringes pale brown with darker line before the tips. Under side fuscous, hind wings and dorsal area of fore wings paler.

Expanse, 16 millim.

Collection number, 555.

One female specimen, Tainan, June 13th, 1905. Comes near *N. basalis*, Moore.

#### ACONTIANÆ.

##### *Westermannia obscura*, sp. n.

♂. Head white, antennæ brown, white at base; thorax and abdomen brownish grey, the former rufous tinged. Fore wings purplish grey inclining to brownish on the terminal area; costa (narrowly) and dorsal area, from base to postmedial line, pale brown slightly rufous tinged; a somewhat conical brown spot in the cell near its outer extremity, and a larger spot below it, both outlined in whitish; postmedial line whitish, excurved from costa to vein 5, thence onwardly oblique to dorsum; a brown spot before the tornus outlined in whitish; subterminal line blackish, wavy. Hind wings pale brownish outwardly suffused with dusky. Under side pale brown suffused with blackish, except on the costal area of the wings; two pale dots at end of the cell on fore wings.

Expanse, 34 millim.

Collection number, 174.

Two male specimens from Kanshirei, March, 1908.

This species is very close to *W. superba*, Hübn., from which it is chiefly distinguished by the more slender spot at end of cell, the gently curved not elbowed, postmedial line, and the general dingy coloration.

A MONOGRAPH OF THE GENUS *ACRORICNUS*, RATZEBURG.  
Family ICHNEUMONIDÆ : Subfamily CRYPTINÆ : Tribe CRYPTIDES.

By CLAUDE MORLEY, F.Z.S.

THIS genus has been thrice described under distinct names : first as above by Ratzeburg (Ichn. d. Forst. iii. 1852, p. 92), secondly as *Xenodocon* by Förster (Verh. pr. Rheinl. 1855, p. 237), and Kriechbaumer (Ent. Nachr. 1878, p. 22 ; cf. also p. 251 *et lib. cit.* 1879, p. 3), and finally as *Linoceras* by Dr. Taschenberg (Zeits. Ges. Naturw. xxv. 1865, p. 105) ; though its distinction from the earlier *Osprhynchotus*—of which I treated in Entom. 1914, p. 23—was only so recently understood that Dalla Torre commingled the species of both in 1900. From the latter it is at once recognised by the possession of two instead of a single basal, metathoracic transcarinæ ; and from both that genus and the closely allied *Joppidium*, Walsh, in its hyaline or subhyaline wings, which in both those genera are nearly or quite nigrescent or infumate throughout. Only six species are represented in the British Museum and my own collection ; a profusely ornate form from Persia (var. *pulcher*) is described by N. Kokujew in his “Hymenoptera asiatica nova” (‘Revue Russe d’Entomologie,’ 1905, p. 208) of *A. elegans*, Mocs. (Magy. Akad. Termész. Ertek. xiii. 1883, p. 11, female), which I do not know.

The genus is of peculiar interest on account of its parasitism upon bees and wasps, members of its own Order.

TABLE OF SPECIES.

- |       |     |   |                                |
|-------|-----|---|--------------------------------|
| (10). | 1.  | Upper and lower margins of the discoidal cell parallel.                 |                                |
| (7).  | 2.  | Posterior metanotal transcarina entire throughout.                      |                                |
| (6).  | 3.  | Mesonotum and most of the abdomen black.                                |                                |
| (5).  | 4.  | Face, abdomen and scutellum black ; legs rufescent . . . . .            | 1. <i>macrobatus</i> , Grav.   |
| (4).  | 5.  | Face, abdominal bands and scutellum pale ; legs flavescent . . . . .    | 2. <i>seducator</i> , Scop.    |
| (3).  | 6.  | Mesonotum and abdomen brick-red, with flavous markings . . . . .        | 3. <i>syriacus</i> , Mocs.     |
| (2).  | 7.  | Posterior metanotal transcarina centrally obsolete                      |                                |
|       | 8.  | Metathorax long, subdeplanate ; face flavous                            |                                |
|       |     |   | 4. <i>peronatus</i> , Cam.     |
|       | 9.  | Metathorax short, convex ; face centrally black . . . . .               | 5. <i>ambulator</i> , Smith.   |
| (1).  | 10. | Upper and lower margin of discoidal cell distinctly divergent apically. |                                |
| (12). | 11. | Nervellus centrally intercepted ; abdomen red-marked . . . . .          | 6. <i>melanoleucus</i> , Grav. |
| (11). | 12. | Nervellus intercepted above centre ; abdomen all black . . . . .        | 7. <i>junceus</i> , Cress.     |

[Of the remaining five species included in this genus, the three described from Brazil by Taschenberg (Zeits. Ges. Nat. 1876, pp. 71–74) have not been mentioned since first brought forward; nor has *A. edwardsi*, Cress. (Proc. Acad. Philadelphia, 1878, p. 365); though the last, *A. cloutieri*, Provancher (Natural. Canad. 1874, p. 150), has twice been figured (*lib. cit.* 1879, p. 110, fig. 2b *et* Faun. Ent. Canad. Hym. 1883, p. 343, fig. 35ab).]

### 1. *ACRORICNUS MACROBATUS*, Grav.

*Cryptus macrobatus*, Gr. Ichn. Europ. 1829, ii. p. 440; *Acroricnus schaumii*, Ratz. 1852, p. 92.

The only species with entirely black abdomen and metathorax. Folard sent a pair to the Rev. T. A. Marshall from Avignon in August and September, 1891–2; of two in Ruthe's German collection, one was captured by Bermuth, possibly with Ratzeburg's type; Dr. L. W. Sambon found a female in Ostia during 1901; and Bucheker had the species from Lagern on August 8th in "Alp. Thät." in the Engadine above St. Moritz, from Zürich on July 1st, and elsewhere in Switzerland. This is the only British species of the genus, and has hitherto been known only from the extreme south—Hampshire, Isle of Wight, and Devonshire—though there appears to be no reason for supposing it confined to those counties, since Dr. A. Roman tells me that in Sweden it extends "at least as far north as western Dalecarlia" (latitude 61°—that of the Shetland Islands)—and that it is there not rare in dry localities. Its known British range is, however, extending, for I have recently seen specimens from Romsey in Hants (Buckell), Milford Haven in Wales on June 4th, 1910, and Stradbally, co. Waterford, in Ireland, at the end of June, 1907 (Andrews). It is known to parasitise several species of the wasp genus *Eumenes* and the bee genus *Osmia*.

### 2. *ACRORICNUS SEDUCTOR*, Scop.

*Ichneumon seductor*, Scop. Delic. Faun. 1786, p. 57; *Xenodocon ruficornis*, Först. 1855.

A large and handsome black and flavous species; occurring on both north and south shores of the Mediterranean from Provence to Algeria, but probably commonest in Italy. The Rev. T. A. Marshall told me in 1898 that he was then noticing the species abundantly about the nests of a wasp in stone walls at Ajaccio in Corsica, but his collection contains but a single example sent by Folard, who took it at Avignon on October 1st, 1892; I possess the species from Oldenberg's collection, taken in the middle of July, 1899; and the British Museum has a short series, taken in Italy by Birch, as well as in Albania between 1843 and 1850 by Sir Sydney Saunders, who says of one particular male there "Parasite on *Pelopæus spirifer*,"



taken with it. Moesáry has bred it from a second species of the Sphegid genus *Sceliphron*, *S. destillatorium*, Illig.

### 3. ACRORICNUS SYRIACUS, Moes.

*Osprhynchotus syriacus*, Moes. Magy. Akad. Term. Ertek, 1883, p. 12, male; *Acroricnus syriacus*, Morl. Entom. 1914, p. 23, female.

The unique female of this handsome Syrian species is in the British Museum.

### 4. ACRORICNUS PERONATUS, Cam.

*Osprhynchotus peronatus*, Cam. Entom. 1902, p. 182; cf. *Spolia Zeylanica*, 1905, p. 97.

The author of this species, in 1905, pleads ignorance of *Osprhynchotus* when first bringing it forward, and then places it in *Linoceras*, where it is sufficiently correct, though the nervellus is intercepted somewhat below and not above its centre as is usually there the case; the metathorax is, however, bicarinate, though the apical transcarina is indistinct and obscured at the juncture of two colours. It is a common Indian species, and, besides the type, I have seen it from the Khasi Hills of Assam, Simla, in May, 1897, one which flew on to a table in Dehra Dun in the North West Provinces on June 22nd, 1902, Sikkim at 1800 ft. in 1897, the Kangra Valley of the Punjab at 4500 ft. in April, May and September, 1899, the Lushai Hills of Assam at 3600 ft. on July 14th and 17th, 1904, and Sukna in the Eastern Himalayas at 500 ft. on July 2nd, 1908.

### 5. ACRORICNUS AMBULATOR, Smith.

*Cryptus ambulator*, Smith, Trans. Ent. Soc. 1874, p. 392, female.

The British Museum type of this species belongs to the present genus and differs from the last species only in its much shorter and more convex metathorax, the apical colour of which is not centrally produced basally, in its centrally black face and in the black abdomen with apex of basal segment alone pale. It is from Hiogo in Japan and not, as given by Dalla Torre, from China.

### 6. ACRORICNUS MELANOLEUCUS, Grav.

*Cryptus melanoleucus*, Gr. Ichn. Europ. 1829, ii. p. 489; *Linoceras melanoleucus*, Tasch. 1865.

Gravenhorst knew a couple of Italian females, which were revised by Taschenberg, but hardly anything appears to be otherwise known of this species in Nature; and I do not vouch for the correct determination of a male so named by Marshall, who took it in "Corsica"; this male is very like a small example of *Habrocryptus porrectorius*, with no flagellar band.

7. *ACRORICNUS JUNCEUS*, Cress.

*Cryptus junceus*, Cress. Proc. Ent. Soc. Philad. iii. 1864, p. 295, female.

A pair of this species, which is a true member of the present genus, though not hitherto placed here, was sent by Professor Riley to the Rev. T. A. Marshall through the United States National Museum in 1888, and is now in the British Museum. It is similar to *A. macrobatus*, though much more slender and a little smaller with the scutellum, petiolar area of metathorax and the legs (except hind femora, trochanters and lower side of their coxæ) pale flavous. Dr. Lewis originally took the female in Illinois; it is poorly figured in the 'American Entomologist,' i. 1869, p. 137, in the excellent article "Wasps and their Habits" by Walsh, who had bred this "beautiful Ichneumon fly" from the "mud dabs" of the Fossorial genus *Agenia*, and noticed its "peculiar and, to us, very agreeable smell of a Humble-bee (*Bombus*). At lib. cit. iii. 1880, p. 154, the same block is reproduced with the information that the species had again been bred from *Odynerus*, this time from *Odynerus birenimaculatus*, Sauss., in New Jersey.

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## AN ACCOUNT OF AN ENTOMOLOGICAL TRIP TO CORSICA.

BY GERARD H. GURNEY, F.E.S.

(Concluded from p. 151.)

HERE also *E. jurtina* var. *hispulla* was abundant, and I took one very curious pale-bleached specimen. Presently a large bright orange looking butterfly got up at my feet, and dashed off, only to settle again further on. A careful stalk, and my first *Argynnis elisa* was safely netted—a male, and evidently but newly emerged. Almost directly afterwards I saw Mr. Lomax wildly pursuing a large butterfly with shouts of "Pandora!" and sure enough he presently came up triumphantly with a magnificent specimen of *Dryas pandora*. Further along, in a hayfield, we saw one of the prettiest entomological sights I have ever witnessed—masses of purple knapweed and large pink mallows grew everywhere in the field, and on these were great numbers of *P. cardui*, all exquisitely fresh; and as they flew from red flower to red flower, their own red wings shining like garnets in the sun, with occasional glimpses of blue and grey and brown under sides, I felt one could not see a more exquisite sight in nature. Butterflies were very numerous hereabouts; some fine big *P. icarus* shared the knapweed with the *cardui*, and *Cænonympha pamphilus* var. *lyllus* was not uncommon, with

plenty of *C. edusa* and odd examples of *P. atalanta* and *Vanessa io*, while *C. corinna* was generally distributed. Here also two or three specimens of *Hesperia serratulæ* were taken.

Going on past Tattone station we found more likely looking ground in a sheltered valley, along the bottom of which a delightful stream meandered, shaded by immense chestnut trees. Occasional fine *D. pandora* were taken off thistles near Tattone station, but it was still rare, and *A. elisa* proved to be just emerging, for we took several more males; they are a quick bold flyer, and not easy to catch. By the afore-mentioned stream we got two specimens of a fine form of *Cyaniris argiolus* var. *parvipunctata* and the first *Satyrus neomiris*, while we noticed *P. egeria* and *L. sinapis* to be not uncommon and a single *Pieris napi*, with stray examples of *V. io*, *P. brassicæ*, and one immense female *I. lathonia*.

A few days later—on June 30th to be exact—we walked over the Col de Vergio to Bocognano, a large village beautifully situated amongst groves of large chestnut trees, and at some 2000 ft. lower elevation than Vizzavona. It was very cold when we started, and there was much fresh snow on Monte d'Oro. However, when we emerged from the Vizzavona forest the sun was shining brilliantly, and as we walked along the white winding road, always downhill, we were soon warmed up; and though insects were few and far between, the odd examples of *A. elisa* and *C. corinna* which we picked up served to enliven the walk. When we got near to the village I missed a specimen of *A. urticæ* var. *ichnusa*, the first one I had seen. In one or two of the hayfields surrounding Bocognano, where the hay was still uncut, a magnificent form of *P. icarus* was found, the males extremely large and fine, the females equally large and distinct, with broad bands of orange spotting on the upper side of the lower wings. Here also *C. corinna* was almost common, and beautifully fresh *A. elisa* kept turning up, but were always difficult to catch; while a single fine *D. pandora* was added to the bag. But by one o'clock the weather had hazed in, and with the departure of the sun a cold wind sprang up with slight rain, and all collecting was over for that day; and for the next four or five days the weather remained most unpropitious and nothing could be done. Moreover, up at Vizzavona the conditions became quite Alpine, and one was glad of all one's thickest clothes. On July 4th we went to Corte, hoping to find at this considerably lower elevation better weather and things generally more advanced; but, however, the Fates were again against us, as although it was considerably warmer than at Vizzavona, we only had two really good collecting days, the remainder of the time being absolutely spoilt by the tornadoes of wind which made it quite impossible to do anything out of doors whatever.



Corte is certainly one of the most picturesquely situated towns I have ever seen. It is full of beautiful old eighteenth-century houses with fine wrought ironwork staircases, and an interesting church with a well-carved pulpit. Excepting, perhaps, Tangiers, it is the most malodorous place I have ever been in, and the Hôtel du Nord, where we stayed, is, to say the least of it, primitive in the extreme; our bedroom—for we had to share a room for the first two days—proved indeed to be a most happy hunting-ground, and quite a collection of various orders of insects was made here! All the same, for those who are not too particular, and do not mind roughing it a bit, Corte is an enchanting spot, and once outside the town, in the beautiful gorges of the Restonica and Tavignano, one very soon forgets the smells and disagreeables, for the romantic valleys are made quite lovely by the mountains and chestnut trees all round.

Butterflies, though not generally abundant, were certainly more advanced here than at Vizzavona. On the rough ground round the town *Satyrus semele* var. *aristæus* was not uncommon—all males and quite fresh. A few *Pontia daplidice* were noticed, and odd specimens of *Papilio machaon*, *C. edusa*, *Pieris rapæ*, and *P. brassicæ*, the two latter species rather frequent, haunting the small vegetable gardens outside the town; while in one place some very small *P. icarus*, *Carcharodus alceæ*, and *P. astrarche* var. *calida* turned up.

Next day we ascended the Restonica Gorge. *D. pandora* occurred occasionally, and some way up the valley *D. paphia*, with var. *immaculata* and var. *valezina*, was rather common and fond of sitting on the leaves of the chestnut trees. Here also, getting up off the path, *S. neomiris* occurred not infrequently, and *C. corinna*, too, was common and quite fresh. A large dark butterfly, when captured, proved to be *Eugonia polychloros*, the only one I saw in Corsica; and at one spot by the roadside two or three specimens of *Polyommatus baton* were taken, and the first fresh *P.* var. *tigelius* noted. Nearer the town, as we came home, *E. ida* and *E. tithonus* were both rather frequent amongst some bramble bushes.

The Tavignano Gorge, up which we went on the 7th, and in which we spent a most delightful day, proved to be the best place round Corte for butterflies. *C. corinna* in beautiful condition was very abundant, with plenty of fine, darkly-marked *C.* var. *eleus* and occasional *S.* var. *aristæus*, including the first female. Higher up *S. neomiris* became quite common, and I was soon able to take as many as I wanted. Magnificently fresh *D. pandora* were constantly seen, always sitting on the tall red thistle heads. The majority of the specimens which I took here and at Vizzavona have very little silver on the under side of the hind wing; they nearly all tend to ab. *paupercula*. Most of the specimens have the silver reduced to a row of pin-pricks,



and one small crescent-shaped mark next the costal margin; the central and hind marginal streaks are entirely wanting. In two or three specimens the ground colour of the under side is a rich golden green, very different from the pale blue green under sides of my Hungarian specimens, which are all heavily streaked with silver; the latter are decidedly larger than the Corsican examples, and of course not nearly so dark.

A few days later and we were back again at Vizzavona. Here things had certainly advanced in our absence. *A. elisa* of both sexes was now very common all round Tattone, but not out yet at Vizzavona itself. Amongst the chestnut trees or in the hay-fields near Tattone station fine fresh *Satyrus circe* were quite common, and *S. neomiris* was frequent; while on the yellow *spartium*—which looks so much like broom but isn't—*L. bæticus* was by no means rare, and occurred up to Vizzavona station. Near here also we frequently took odd specimens of the fine form of *C. argiolus* var. *parvipuncta*. Our beautiful purple field of knapweed and mallow had been ruthlessly mown, and the butterflies had disappeared; but hosts of still fresh *P. cardui* and *E.* var. *hispulla* were abundant amongst the bracken further up; and *C. edusa*, with no var. *helice*, raced over the little flowery patches; and before we left odd examples of *D. paphia* were secured, for it was just beginning to come out on July 18th. These *paphia* and those which we took at Corte all incline very considerably to var. *immaculata*. I took none that could be considered type, and in many cases there is no trace whatever of silver on the under side of the hind wings. One or two specimens of var. *valezina* also have no sign of silver markings, but are of a very rich green all over.

We had naturally been always keenly on the look-out for *Papilio hospiton*, and had searched miles of country all round Vizzavona and Tattone for larvæ, but we never saw a sign of anything approaching either the butterfly or the larva, and I could only suppose that owing to the late season it was not yet out. There was a good deal of a species of fennel growing between Vizzavona and Tattone, which I thought very likely might be the food-plant of *P. hospiton*, but there were no larvæ on any of these plants. When we returned to Ajaccio, I met a French entomologist who lived there, and he gave me a lot of information about *P. hospiton*. He said it was certainly fully out, and the previous Sunday he had taken four near a village between Tattone and Corte, which he considered its headquarters; but that it was extremely local, and only to be found where its food-plant grew, and that the fennel I had seen at Vizzavona and Tattone was *not* the one the larva fed on; in fact it did not grow in that district at all. When I asked him why other collectors had found *P. hospiton* near Tattone, he said he considered that they were chance examples which had been carried

there out of their usual beat. He told me that he took *Charaxes jasius* in the hills above Ajaccio very commonly in August and September by means of jars of honey, which attract them. We stayed a day at Ajaccio, but beyond an apparently fresh brood of *E. ida* we found nothing of interest, and everything was fearfully burnt up. And so ended a trip, which, if not entomologically a very great success, at any rate gave us a delightful holiday in a new and particularly attractive country. Appended is a full list of the Rhopalocera which I identified during our stay in Corsica:—

*Carcharodus alceæ*, *Hesperia serratulæ*, *Chrysophanus phlæas* var. *eleus*, *Polyommatus icarus*, *P. astrarche* var. *calida*, *P. baton*, *Plebeius argyrognomon* var. *bellieri*, *P. argus* (*ægon*) var. *corsica*, *Cyaniris argioides* ab. *parvipuncta*, *Lampides bœticus*, *Tarucus telicæus*, *Papilio podalirius*, *P. machaon*, *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Pontia daphnoides*, *Leptosia sinapis*, *Colias edusa*, *C. hyale* (doubtful), *Gonepteryx rhamni*, *Dryas paphia*, and var. *valezina* and var. *immaculata*, *D. pandora* and ab. *paupercula*, *Issoria lathonia*, *Argynnis elisa*, *Pyrameis cardui*, *P. atalanta*, *Vanessa io*, *Aglais urticæ* var. *ichnusa*, *Eugonia polychloros*, *Polygonia c-album*, *Pararge megæra* var. *tigellus*, *P. egeria*, *Satyrus circe*, *Hipparchia semele* var. *aristeus*, *S. neomiris*, *Epinephele jurtina* var. *hispulla*, *E. tithonus*, *E. ida*, *Cœnonympha corinna*, *C. pamphilus* var. *lyllus*.

Keswick Hall, Norwich.

## NOTES ON EUROPEAN HESPERIIDS.

By H. ROWLAND-BROWN, M.A., F.E.S.

ON pp. 141–142 of the May 'Entomologist,' Mr. W. G. Sheldon publishes a list of the more difficult Black-and-White Skippers of the genus *Hesperia* included in his collection. It may be further helpful to collectors on the Continent if I supplement this interesting catalogue with a list of the Hesperiids of this group in my own collection, taken either by myself or by my friends, and specifically identified either by examination of the male appendages, or by myself, with the assistance of those entomologists of whose work I have already availed myself for previous notes published in this magazine (Entom. xliii. 306–309; xlv. 5–7 and 77–78; xlv. 8–11, 25–26, and 109–110). Mr. Sheldon does not adopt M. Oberthür's nomenclature for *cirsii*, Rbr., viz. *fritillum*, Hb. Otherwise he is in accord with this classification. But I only follow his arrangement of the genus under review for convenience of reference.

*Hesperia alveus*.—Unquestionably a mountain species, where it occurs throughout the western palaearctic region, or, at all events, never in my experience descending to the plain. Arolla, August (middle), 1896; Saas Fée, August (middle), 1897; Zinal, August,

1898; Mt. Penegal, Mendel Pass, July, 1904; Mont Canigou, E. Pyrenees, July 7th, 1905; Gavarnie, July 14th-30th, 1911; Horkulesbad, S. Hungary, July 4th, 1912; Allos at the Lac, July 18th-23rd; Larche, July 25th-29th, 1913; Le Vercors, above Baraques (Drôme), July 7th, 1913.

Var. *ryffleensis*, Obthr.—Simplon, August (beginning), 1897; Saas Fée, August (middle), 1897; Franzenshöhe, Stelvio, July 13th-20th, 1900; Larche, July 25th-29th, 1913.

Var. *foulquieri*, Obthr.—Which, I suggest, is a form rather of *H. bellieri*, Obthr.; Cevennes, Balsièges, July 29th, 1901; Florac, Causse Méjean, July 18th; Empézou, July 19th, 1901; Digne, August (beginning), 1903, and August (beginning), 1908; St. Martin-Vésubie, July (middle), 1903.

*H. serratula*.—Chamonix, August, 1894 (Miss Fontaine); \*Saas Fée, Bérissal, Simplon, August, 1897; Zinal, August, 1898; Chiesa, Piedmont, July 8th-10th; Stelvio, July 12th-19th, 1900; Gavarnie, July (middle), 1905, and July 14th-29th, 1911; Lavey, June 6th, 1908; Simplon, June, 1908 (A. S. Tetley); Le Lioran, Cantal, August 1st-8th, 1909; Brenner, July (end), 1912; Larche, July 23rd-29th, 1913.

I have no examples in my collection at present of the plain form from the west of France, &c. (=var. *occidentalis*, Lucas).

*H. onopordi*.—Aix-en-Provence, April, 1894; Sebdou, Algeria, July and August, 1904; Albarracin, July, 1905 (Miss Fontaine); Brantes, Vaucluse (under Mont Ventoux), April, 1907 (H. Brown); Digne, April (beginning), 1902 (= *conyzæ*, Guen.).

\**H. armoricanus*.—Gibraltar, San Roque, 1887 (J. J. Walker); Mentone, April, 1894 (Miss Fontaine); St. Malo, "été, 1899" (C. Oberthür); La Foce, Corsica, July (middle), 1903; Dunes de Miel Pot, between St. Malo and Cancale, August 15th-25th, 1910 (C. Oberthür); Cancale, no date (R. Oberthür); Constantinople, September, 1911, and May, 1912 (P. P. Graves). And to these localities may now be added probably all the northern and other lowland "*alveus*" of the French local catalogues.

*H. carlinæ*.—Bérissal, August, 1897; Saas Fée, August, 1894 and 1897; Zinal, August, 1898, Binnenthal, August, 1907; Allos, August, 1908, July, 1913; Larche, July, 1913.

Var. *cæcus*, Err. Saas Fée, Aug. 1894 and 1897; Bérissal, Aug. 1897.

*H. fritillum*, Hb. (= *cirsii*, Rbr.).—Chamonix, August, 1893 (Miss Fontaine); \*Albarracin, July-August, 1901 (T. A. Chapman); Binnenthal, August, 1907; Allos, August, 1908; Mende, Lozère, August, 1st-6th, 1909.

*H. bellieri*.—Larche; Allos, July, 1913.

*H. malvæ*.—None from Continental localities.

*H. malvoides*.—Biarritz, August, 1905, and July, 1911; Bérissal, July, 1897; Horkulesbad, July, 1900 (H. C. Lang); \*Digne, April, 1902; \*Aurunci Mountains, Central Italy, May 25th, 1910 (P. J. Barraud); \*April, 1910 (O. Querci); \*Lac d'Allos, July 21st, 1913.

\**H. melotis*.—Beirut, Syria, April and July, 1911 (P. P. Graves, from F. Cremona).



## HIBERNATION OF THE LARVA OF *LYCÆNA* *ARGIADES*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

DURING July, 1913, I obtained a large number of eggs from *L. argiades* females which were captured at Rennes. Also many eggs of this species from females captured in Hungary; these were laid during the first half of August.

The larvæ from both the French and Hungarian parents entered into hibernation about the end of September.

After the first moult the larvæ became striped with brown, the ground-colour being pale yellowish; the medio-dorsal and oblique side stripes brown, and the lateral stripe rust-coloured.

After the second moult the ground-colour is pale ochreous-green, the medio-dorsal and lateral stripes are rich purple-brown, and the oblique stripes are paler. The colouring remains similar until after the fourth and last moult, and when fully grown the ground-colour is a very pale pinkish-ochreous; the medio-dorsal stripe is deep purplish-brown, the lateral stripe light chocolate-brown, and the oblique side stripes light rust-colour. They remain so coloured during hibernation.

As the larvæ develop, all the green colouring disappears; and during the last stage no green form existed in any of the larvæ when they entered into hibernation. Some of the larvæ hibernated in the dead rolled-up leaves of *Lotus corniculatus*, and some low down on the stems of the plant. They spin a fine layer of silk to rest upon during hibernation.

No brown form occurred in the last stage of the larvæ reared from eggs laid July 24th, 1904, by a female *argiades* captured in the South of France. Although when young (after the first moult) two distinct forms of the larvæ appeared, one being striped with brown, the other entirely green, with very slightly darker green markings. After each subsequent moult the striped forms gradually lost the markings, and after the last moult all were entirely green, excepting a few which had the lateral ridge tinged below with pinkish-brown.

The larvæ pupated at the end of August, and the imagines emerged between September 6th and 18th inclusive.

The complete life-history of this species I published in the 'Entomologist,' vol. xxxvii. pp. 245-9.

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### NOTES AND OBSERVATIONS.

PANORPA COGNATA (NEUROPTERA).—Mr. H. Scott (University Museum of Zoology, Cambridge) has been good enough to send me a few new records of the scarce British scorpion-fly *Panorpa cognata*. They are: One male, Henley-on-Thames, June, 1906, collected by



H. Scott and determined by K. J. Morton; one male and one female, Henley-on-Thames, August 1st, 1910, collected by H. Scott, determined by K. J. Morton; two males, Henley-on-Thames, June, 1911, collected by H. Scott, determined by K. J. Morton; one male, Wells (Somerset), 1902, collected by C. G. Lamb, determined by H. Scott; one male, "Britain; old coll." (without exact data), determined by H. Scott.—W. J. LUCAS; Kingston-on-Thames.

NOTES ON THE LARVÆ OF *ZYGÆNA EXULANS*.—The recent hot spell in Scotland proved very favourable for searching for larvæ of *Z. exulans* at Braemar, and I found them quite abundant on the flowers of *Empetrum nigrum* during the last few days of April. On one tiny plant I counted eight larvæ. In captivity they seem ready to eat almost any food (some of mine have a keen appetite for petals of wallflower and others take apple-blossom), but they seemed confined to crowberry as I found them. They are exceedingly active in the sunshine, and have a most extraordinary capacity for escaping from captivity.—C. MELLOWS; Bishop's Stortford College.

CALLOPHRYS RUBI IN APRIL.—On April 21st I saw several *C. rubi* flying round broom on the hills at Braemar about the 2000 ft. contour. Perhaps they were in a sense "forced" by the extraordinary "sun-heat," the maximum reading for the day being 70° F.—C. MELLOWS; Bishop's Stortford College.

[*Euchloë cardamines*, among other species, has also been seen on the wing at an unusually early date this year. Records of such occurrences would be of interest.—ED.]

AGRIADES (POLYOMMATUS) CORYDON var. HISPANA IN THE BASSES-ALPES.—A few days ago I received from my friend Mr. C. E. Morris, of Le Cannet, Alpes-Maritimes, a water-colour sketch of a Lycaenid, with the request that I would identify the same for him. The butterfly turns out to be *Agriades corydon* var. *hispana*, H.-S., and according to the Rev. George Wheeler, who kindly named it for me, though by no means rare elsewhere, has never before been reported from the French Alps. This example, which must be regarded as an aberration rather than one of a local race, was captured by Mr. Morris near Barcelonnette, very little higher than the town, flying over mud, on June 25th, 1913.—H. ROWLAND-BROWN; Harrow-Weald, May 12th.

COLEOPTERA AND HEMIPTERA OF NORFOLK.—Mr. J. Edwards, Colesborne, Cheltenham, will be grateful to entomologists who have collected Coleoptera or Hemiptera in Norfolk during the past five years for particulars of their captures for present publication.

HIPOCRITA JACOBÆE IN EARLY MAY.—At Tuddenham, Suffolk, I saw great numbers of *Hipocrita jacobæe* on the wing on May 3rd. Is not this an unusually early date? Perhaps I might add, as an interesting parallel, a nest of the wheatear, with young, in the same district.—W. R. TAYLOR; Jesus College, Cambridge, May 5th, 1914.

MELANIC FEMALE OF *BISTON HIRTARIA*.—I have the good fortune to report the emergence of a perfectly melanic female of *B. hirtaria*. The insect was bred from a pupa dug up at Finchley. The specimen

is slightly larger than normal, and of a unicolorous black, absolutely devoid of all markings; the wings are thinly scaled, as is usual with the female of this species. Mr. Prout has kindly given me the following information regarding this uncommon form of *hirtaria*. He says: "I find in Oberthür's 'Etudes de Lepidopterologie Comparée' there is a figure of a unicolorous black female *hirtaria* from Silesia, and there is one equally unicolorous, but not quite as extreme (with a brownish tinge), in the British Museum collection from England. It is called by Oberthür ab. *fumaria*, Haw, and is mentioned by that name in one or two other books." I might add that the whole of the insect—body, legs, and antennæ—is jet black.—B. S. WILLIAM; 77, Durham Road, E. Finchley, N.

HIBERNATION (?) OF PYRAMEIS ATALANTA.—In view of Mr. Corbet's note in your last issue (p. 151), it may be of interest to record that I saw and watched for some time a worn *P. atalanta* flitting about in the flower garden here on March 23rd.—E. F. STUDD; Oxtou, Exeter.

EUCHLOË CARDAMINES TWO YEARS IN PUPA.—On October 20th last (Entom. xlv. p. 317) I brought to your notice a very late emergence of *E. cardamines*. I have now the pleasure to report an instance of a butterfly, a female, from the same brood of larvæ remaining in the pupal state for two winters. These larvæ were given me by my friend, the Rev. Gilbert H. Raynor, on June 20th, 1912, and the insect referred to emerged yesterday morning, the 20th inst.—B. W. NEAVE; Lyndhurst, 95, Queen's Road, Brownswood Park, N., May 21st, 1914.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, April 1st, 1914.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Mrs. Maria Ernestina Walsh, Soekaboemi, Java; Messrs. J. P. Ramakrishna Aiyar, B.A., F.Z.S., The Agricultural College, Coimbatore, South India; Eugène Bendefitter, 11, Rue St. Jacques, Le Mans, France; Rev. Prebendary Edward Grose Hodge, The Vicarage, Paddington; A. J. T. Janse, 1st Street, Gezina, Pretoria, South Africa; Charles Nicholson, 35, The Avenue, Hale End, Chingford, N.E.; Frederic de la Mare Norris, B.Sc., The Agricultural Department, Kuala Lumpur, Malay States, were elected Fellows of the Society.—Dr. T. A. Chapman exhibited some specimens of the genus *Curetis* from the Tring Museum, to illustrate a point in mimicry, and read notes upon them.—Dr. F. A. Dixey, specimens of *Pierinæ* from Western China, with drawings of their scent-scales, and remarked on them.—Mr. O. E. Janson, both sexes of a new *Papilio* belonging to the *gambrisius* group and apparently most nearly allied to *P. ormenus*, Guér., also the rare *Papilio gabrielis*, Roths., both recently received from the Admiralty Islands.—Mr. Donisthorpe, a small nest of the ant *Cremastogaster schenki*, Forel, from Madagascar,

fastened on the stem of a tree. Also a small beetle, *Semiclaviger sikora*, Wasmann, which came out of this nest, and is a guest of *C. schenki*.—Mr. C. B. Williams, specimens of the genus *Acerentulus* of the order Protura.—Mr. E. B. Ashby, a female of *Dryas pandora*, with darkly suffused underside hind wing, very near the ab. *lilacina*, Obth., from La Granja; also an aberration of *Melitea athalia*, from Hinterzarten, belonging to the *eos* group of aberrations of this species.—The following papers were read:—"Descriptions of South American Micro-Lepidoptera," by E. Meyrick, B.A., F.R.S., F.E.S.; "A Revision of the Tipulid Genus *Styringomyia*," by F. W. Edwards, F.E.S.—GEO. WHEELER, M.A., *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*April 23rd.*—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—A special exhibition of Orders other than Lepidoptera.—Mr. C. W. Colthrup exhibited a large collection of British land shells.—Mr. Stanley Edwards, numerous large and conspicuous species of exotic Coleoptera and Hymenoptera.—Mr. Ashdown, a collection of Swiss Coleoptera, including forty species of Longicornia taken by himself.—Mr. Gibbs, the lantern-flies *Fulgoria lanternaria* and other conspicuous insects sent to him from British Honduras among a collection of butterflies and moths.—Mr. Step, male and female *Asilus crabroniformis*, a predaceous Dipteran, with *Tachinus grossa* and *T. fera*, two hairy flies which attack larvæ.—Mr. West (Greenwich), thirteen drawers of the Society's reference collection (Coleoptera, Orthoptera, Neuroptera, Hymenoptera, and Hemiptera), a box of typical examples of Diptera presented to the Society by Mr. Andrews, and his own collection of British Homoptera.—Mr. C. B. Williams, the beetle *Lochmæa suturalis*, on heather from Cheshire, and willow-stems damaged by larvæ of *Cecidomyia saliciperda*.—Mr. Andrews, the following very rare Diptera, and contributed notes:—*Lispe pygmæa*, Fall., *Limnophora æstum*, Vill., *Macronychia griseola*, Fall., all from Porthcawl, *Phorbia parva*, Ztt., from Chattenden, *Fannia ciliata*, Stein., from Milford, and *Chirosia parvicornis*, Ztt., from North Kent.—Mr. Dennis, photograph of plant-galls.—Mr. E. E. Green, many species of Coccidæ, largely from Ceylon, with coloured drawings of their life-histories.—Mr. B. Adkin, pieces of bark showing depredations of the Homoptera *Chermes corticalis* on larch, and *C. viridis* on Weymouth pine.—Mr. Moore, nine hundred and twenty-five mites of the genus *Gamius* taken from a beetle.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, *March 16th*, 1914.—Mr. R. Wilding, President, in the chair.—Professor Robert Newstead, M.Sc., F.R.S., gave a lecture entitled "Some Observations on the Natural History of Nyassaland." The lecture, which dealt with the Professor's own experiences during an expedition undertaken to discover the breeding habits of the Glossinidæ, was most interesting, especially the account of the finding of the first pupa of *Glossinia morsitans*, and of the connection between this fly and sleeping sickness and "ngana." A capital photograph shown on the screen recorded



this historic event.—Mr. A. W. Hughes exhibited *Phigalia pilosaria*, including a pale olive unicolorous variety, from Eastham, also *Hybernia leucophæaria* and var. *marmorinaria* from the same locality; he further reported that *Nyssia zonaria* had been plentiful at Crosby. —WM. MANSBRIDGE, *Hon. Sec.*

## RECENT LITERATURE.

*Catalogue of the Lepidoptera Phalaenæ in the British Museum.*  
Vol. xiii. By Sir GEORGE F. HAMPSON, Bart. Pp. i-xiv, 1-609.  
London: Printed by order of the Trustees. 1913.

In this volume, the tenth dealing with Noctuidæ, the genera and species of Catocalinæ remaining over from vol. xii. receive treatment, and the subfamilies Mominæ and Phytometrinæ are considered.

Altogether 70 genera and 679 species are here classified, and of these 379 species in 44 genera are assigned to Catocalinæ; 11 genera and 74 species to Mominæ and 15 genera with 226 species to Phytometrinæ.

The largest genera of the Catocalinæ now considered are *Safia*, Guen. (53 sp.), *Zale*, Hb. (49 sp.), and *Mocis*, Hb. (31 sp.).

Sir George Hampson does not accept Hübner's 'Tentamen' names for genera, *Euclidia*, Hb., is therefore rejected. He finds that *fixa*, Fab., is the type of *Euclidia*, Treit., and that the latter name will therefore supersede *Synthymia*, Hb. (a genus belonging to the Acronyctinæ, vol. ix., p. 372). The species usually referred to *Euclidia* are here placed under *Euclidimera*, Hamp. (type *mi*, Clerck), or *Gonospileia*, Hb. (type *munita*, Hb.). *Glyphica*, Linn., is included in the latter genus.

In *Mocis*, Hb., are included *Pelamia*, Guen. (t. *phasaianoides*, Guen.), *Remigia*, Guen. (t. *frugalis*, Fabr.), *Baratha*, Walk. (t. *disseverans*, Walk.), and *Cauninda*, Moore (t. *undata*, Fb.).

"*Catephia*" *trifasciata*, an Australian species described as a British insect by Stephens (Ill. Brit. Ent. Haust., vol. iii., p. 128), is assigned to *Mocis*.

Twenty-one of the species comprised in Mominæ belong to *Trisuloides*, Butl. (t. *sericea*, Butl.), which includes *Tambana*, Moore (t. *variegata*, Moore), and *Anacroniata*, Warren (t. *caliginea*, Butl.).

*Cænobita*, Esp., is the type of *Diphthera*, Ochs., also of *Panthea*, Hb., both of these names, together with *Audela*, Walk., and *Platycerusa*, Pack., fall under *Diphthera*, Treit. (t. *cænobita*, Esp.).

In this connection it may be mentioned that *alpinum*, Osbeck = *orion*, Esp., so frequently referred to *Diphthera*, Hb., has been transferred to *Daseochæta*, Warren (Phal., viii., p. 30).

*Coryli*, Linn., is the type of *Demas*, Steph. (1829), and also of *Calocasia*, Hb. (1827); the latter takes precedence.

In Phytometrinæ the largest genera are *Syngrapha*, Hb. (31 sp.), and *Phytometra*, Haw. (158 sp.). The majority of the species hitherto referred to *Plusia* are here placed under *Phytometra*, Haw. (t. *festuæ*, Linn.).

Some 450 species are depicted in colour on the eighteen plates forming the Atlas issued with this volume.



## OBITUARY.

THE REV. E. N. BLOOMFIELD, M.A.

THERE passed away on April 29th, 1914, the most lovable and one of the most widely known of British entomologists, Edwin Newson Bloomfield, in his eighty-seventh year. He was laid to rest among the spring flowers that he loved, and "during the earlier part of the afternoon old and young, rich and poor, could be seen battling their way against a stiff breeze to pay honour to one who for over half a century had laboured for good in their midst." He had been rector of the village of Guestling, near Hastings, for exactly fifty years, and before that time he lived with the family at Great Glemham, in Suffolk, which house is still occupied by his brother, Col. Alfred Bloomfield, a Justice of Peace for the county in which he owns two hundred and fifty acres. Our subject was the son of Edwin Bloomfield, and was born as long ago as 1827 at Wrentham, near Lowestoft. So far from devoting himself to entomology, he was to a greater extent, probably, than any man living in these days of specialists, all things to all men throughout the gamut of Natural History. In insects he confined his investigations to the indigenous species, but in botany he was as familiar with the ornamental Coniferæ of the garden as with the lowliest wayside flower, all of which he could name at a glance.

His chief hobby was, undoubtedly, the compilation of local catalogues, and when the project was mooted in the seventies of publishing an account of the Flora and Fauna of Hastings, he undertook the flying insects, while Mr. E. A. Butler compiled the ground Orders. Hence it came about that he was always more *au fait* with Lepidoptera, Hymenoptera, and Diptera, than with the Coleoptera and Hemiptera, of which, however, he was by no means ignorant; his range extended to the mammals, birds, fishes, fungi, and I know not how much further. Ecclesiastical architecture also received a share of his attention. No great standard work was issued by him, yet no standard work appeared without due reference to the author's indebtedness to him for assistance; and a great many of the foremost amongst us nowadays owe more than we can say to the kindly help given so freely and unostentatiously in our young days. His last labour was a detailed compilation upon the Diptera of Norfolk and Suffolk, the manuscript of which was sent for completion and publication to Mr. Atmore and the writer from the London nursing home, when he felt the task beyond his failing power; this will appear in the Trans. Norfolk Nat. Society during the present year. Last September Mr. Bloomfield wrote to me: "I find I am in much better health at home. I am in pretty good health and get about well for my age (eighty-six years), but I find a mile out and back is quite enough for me"; this I can picture accompanied by the beneficent and radiant smile which will always live in my memory—the smile with which he greeted us all in his speech at his last public appearance during the Verrall supper of 1913.

C. M.





REED BED NEAR WICKEN VILLAGE, SHOWING "JUNGLE" GROWTH.



A "LOAD" IN THE FEN.

Photos H. A. Storey,  
Caius Coll. Cambridge

WICKEN FEN AS IT IS.

# THE ENTOMOLOGIST

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[No. 614

## WICKEN FEN: ITS CONSERVATION FOR ENTOMOLOGY.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(PLATE IV.)

As no doubt many of our readers are aware, a great part of Wicken Fen has been taken over by the National Trust, and is now being administered by that body. A guardian has been appointed on the spot, and the Entomological Society of London is contributing a not disproportionate share of the necessary wage fund. As nominated member of the Society upon the Council of the Trust, I think, therefore, that it may not be out of place if I offer a few suggestions on the subject from the entomologist's point of view, and at the same time attempt to give some idea of the work being done for the preservation and upkeep of this Mecca of the British collector.

In the first place, it should be remembered that, while the National Trust property amounts in all to as much as 249 acres of the entire 300 acres or so of the area comprised in Wicken Fen, their holding is neither coherent nor coterminous. Within the area lying nearest to Wicken village there are several important strips which break up and divide it, and it stands to reason that this patchwork arrangement is a great hindrance to the work of the conservators. Visitors this year, provided with the needful permits, will find that the Trust lands have been delimited by means of black iron posts marked with the initials N. T. And here I may remark that the object of the Trust is not to close the parts of the fen which belong to them against *bona fide* naturalists, botanists, and other scientific workers, but to preserve for future generations, as far as possible, the fauna and flora characteristic of the locality, while possibly in the future helping to restore to the fen some at least of those species which, either by over-collecting, or much more likely by altered nature conditions, have completely disappeared, or nearly so.

The question then arises how far it is desirable to "garden "



for such purposes, and reduce by cutting and clearing the overgrowths which have sprung up during the last half century, when the wild part of the fenland all about has become ever smaller and smaller under cultivation. For when I visited Wicken on a fair day at the end of May I at once realized how great a change had come o'er the spirit of the scene. Except on the plots where the sedge had been cut already, the whole area presented the appearance of a jungle. A wide grassy drive divides the fen nearest to Wicken village from east to west. But on either side of it there is an almost impenetrable tangle of low shrubby trees, reeds, and coarse grass, by which the more fragile growths have been superseded. This is well enough for reed feeders; for other insects requiring a more delicate sustenance it may mean starvation. On the largest compact acreage belonging to the Trust these conditions are exaggerated; it is cut off from the rest of the fen on this side by a wide ditch; and there is no way of traversing it apparently save by struggling, often breast-high, through the tangle.

I should suggest, therefore, that so far as this last-mentioned piece is concerned a ride be cleared in continuation, as it were, of the one across the stream to which I have drawn attention, with the Pumping Station as objective in a straight line. Then, towards the centre, ways of similar breadth might be made, intersecting the main ride at right angles. This would afford access to this part without in the least depreciating its uses as a preserve, while the Committee, whose care it is to look after the maintenance of the Trust property, might then determine to what extent the work of clearing on this side also should be effected.

At present it seems that the dense growths are prejudicial as well to bird and insect life, and in greater degree to plant life. All such clearing, of course, requires to be done with discretion by those employed, and under direct supervision. But the Cambridge Committee are within easy reach, and skilled fen labour is available near at hand. A large number of the trees and bushes which encumber the inner parts might well be eradicated; their continued encroachment on the fen as such is a real menace.

Again, it is obvious that if the aquatic and semi-aquatic flora is to survive, and with it the special insects that feed thereon, there must be judicious treatment of the waterways. To take a single instance, the one in fact of which I am most competent to speak from experience elsewhere. In my opinion it is impossible to acclimatise *Chrysophanus dispar* var. *rutilus* in Wicken Fen under existing conditions. *Rumex hydrolapathum* is not the sole plant on which the species feeds, I am aware, but it was the Giant Dock upon which the larvæ of the long defunct *dispar* lived, and it is the same Giant Dock upon which the larvæ

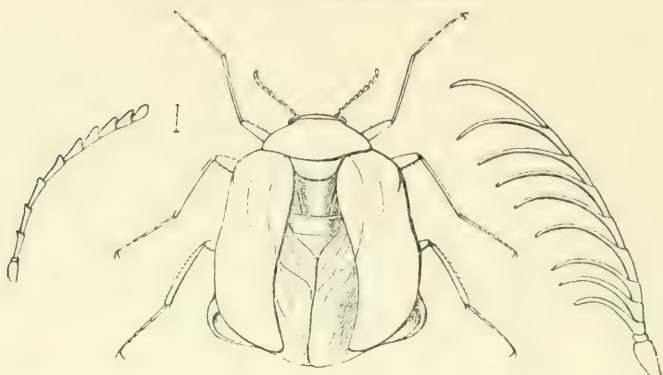
of the double-brooded var. *rutilus* live in the marshlands of Bordeaux.

In a paper published by me in the 'Entomologist' (vol. xliv. pp. 385-389) I gave a very short account of this species in the Gironde. The fen round Bordeaux is as restricted as at Wicken, and much more accessible; but so long as fen it remains, so long will var. *rutilus* remain there, judging by the quantity of this lovely Chrysophanid I saw on the wing the first week of August, 1911. What struck me at once was the favourable nature of the terrain for the food-plant. The vegetation of the ditches where I found belated larvæ was not too rank to strangle it; the banks of the little river where the butterfly was commonest were comparatively clear of over-growths, and the *hydrolapathum* flourished amazingly. If, then, we are to resuscitate the Large Copper in Wicken, whether from French, Hungarian, or German stock, it will be necessary to "garden" the ditches and their banks to this extent, and, further, I suggest that this treatment would encourage rather than quench the fertility of the Wicken specialities affecting other pabulum than reeds. Acclimatisation and the colonisation of species does not figure in the propaganda of the National Trust and the Society for Nature Reserves, but permission to use their property for such experiments would no doubt be readily conceded. *Papilio machaon* apparently requires no artificial stimulus. But here once more I would suggest that, if dealers are warned off altogether, amateurs also should be cautioned and asked to give the captured wasted females their liberty. Notices to that effect might be posted with other rules and regulations in conspicuous places at the entrance, and in the village of Wicken itself where collectors usually stay during the season. Especially are such precautions advisable so long as the whole of the collecting fen is not under the control of the Trust. Finally, I venture to appeal to the several fen proprietors whose lands are not for sale to give our keeper jurisdiction over them in their absence. Of these plots there are not many. One at least is well-defined and segregated from the rest of the fen by broad and well-kept waterways; for the others, I would urge upon their owners the benefit to be derived by allowing the Trust, through its servants, to supervise and prevent trespassers ransacking their natural treasures. A small annual contribution to the Wicken Fund would secure this, and at the same time the arrangement would materially assist the none too easy task of the Trust as entomological conservators of one of the most valuable, if not the most extensive, Nature Reserves in England.

Harrow Weald: June, 1914.

A NEW GENUS OF COLEOPTERA OF THE FAMILY  
PSEPHENIDÆ.

By C. J. GAHAN, M.A.



THE interesting and remarkable beetles which form the subject of the present paper were discovered by Dr. A. D. Imms, who found them in all their stages in rocky, swiftly running streams—the larvæ and pupæ adhering to stones, and the imagines, newly emerged from their pupa-cases, resting submerged under stones alongside their empty pupa-cases. As Dr. Imms proposes to describe fully and give figures of the larvæ and pupæ, the imagines alone will be dealt with here; but in referring them to the family Psephenidæ I have taken into account the habits of the insects and the great general resemblance which the larvæ bear to those of *Psephenus*.

One or two characters possessed by these beetles suffice to distinguish them from all other known Psephenidæ, and from all but a few genera of Coleoptera. (1) The elytra do not meet in the middle line to form a suture in any part of their length. When first I noticed this character I thought it might possibly be due to immaturity, as most of the specimens under observation had apparently only just emerged from the pupa. But Dr. Imms was able to tell me that two specimens swept from grass and fully mature were like the rest in having the elytra rather widely separated from one another. (2) The middle area of the metanotum, behind the broad scutellum, is not grooved along the middle (as it is in the great majority of beetles), but is convex along the middle and marked with a groove along each side. This character is evidently correlated with the first, and shows pretty conclusively that the elytra never do meet in the middle line. We find the metanotum similarly devoid of a median groove in the heteromerous genus *Rhipiphorus*, in which the elytra are small scale-like structures, which do not meet



behind the scutellum; the latter also in this genus being relatively very broad.

*PSEPHENOIDES*, n. gen.

Head moderately exserted; subvertical or somewhat backwardly inclined below; eyes convex, entire, rather finely faceted; antennae not widely separated, nearly as long as body in male, with the joints from the third increasing in length, and strongly flabellate, except the eleventh, which resembles the flabellum of the tenth; much shorter in the female, with the joints from the third serrate and gradually decreasing in length. Mandibles scarcely visible. Palpi slender and ending in a setiform joint; the maxillary about twice as long as the labial. Pronotum slightly convex above, turned down rather strongly at the sides, especially in front; basal margin broadly rounded in the middle, a little sinuate at each side, and making with the lateral margin an angle slightly greater than a right angle. Scutellum very broad, rounded behind. Elytra separated from one another, inner margins somewhat sinuate. Metanotum convex along the middle, marked with two very slightly curved, posteriorly converging grooves. Prosternal process triangular, pointed behind, but scarcely prolonged beyond the front coxae; the latter prominent, strongly transverse, with their acetabula widely open behind. Mesosternal process broad, channelled along the middle. Legs long and slender, with very long tarsi, the first and fifth joint of which are much longer than either the second, third or fourth, which gradually diminish in length; claws long, with a slight "feson" at base. Abdomen in both sexes with six ventral segments visible, the sixth being very small and narrow, the fourth strongly arcuate in the middle behind, the fifth nearly truncate behind.

Type of the genus *P. immsi*.

*Psephenoides immsi*, sp. n.

Dull brownish black in colour, covered with a short faint pubescence. Femora yellowish, becoming dusky towards the tips, where the colour is nearly as dark as that of the tibiae and tarsi. Scutellum glossy. Wings, visible behind between the elytra, are dusky in colour. (In the female specimen figured, the wings were bulged out a little at the sides of the elytra where they show behind, but this condition is not normal.) In all the specimens seen by me the short, bead-like, second joint of the antennae is almost entirely yellowish in colour; but it would probably be darker in more matured specimens.

Length, ♀  $3\frac{1}{2}$ –4 mm. Breadth, 2 mm.

*Hab.* Bhowali, Kumaon, 5700 ft., May 15th, 1912 (A. D. Imms).

The male antenna figured is from a specimen taken at Lachiwala, near Dehra Dun, on February 8th, 1913; it is possible, as Dr. Imms thinks, that the specimens from this locality represent a distinct species. But I have not been able to detect any appreciable difference between specimens from the two localities. The type of the species is a female specimen from Bhowali.



## BRITISH NEUROPTERA, 1913.

BY W. J. LUCAS, B.A., F.E.S.

**Alder-flies.**—*Sialis lutaria* was noticed first on May 18th, at the Black Pond, Esher Common (Surrey)—probably not the beginning of its flight, for the species may sometimes be taken in April. On June 1st it was found at Frensham Pond (Surrey). Col. J. W. Yerbury gave me three examples, taken at Aviemore in the Highlands—males on May 25th and 26th, and a female on May 29th.

**Snake-flies.**—On April 20th Mr. G. T. Lyle and myself made a lengthy search for larvæ and pupæ of *Raphidia*, at Irons Hill Inclosure, in the New Forest. We were not at all certain where they might be found, but as the imagines had been plentiful in the spot the previous season, it seemed likely that we might discover where the earlier stages were passed. We at length found that a favourite habitation for larvæ and pupæ was the dead bases whence the lower branches of Scotch fir had been broken off. Though decayed, these were more or less dry inside, so, apparently, much moisture is not absolutely necessary for these insects. Two larvæ (by size apparently *Raphidia notata*) were obtained under the bark of a dead but standing Scotch fir. Judging by size alone, we found larvæ and pupæ of *R. notata* and *R. maculicollis*—a dozen or more in number. Pupæ were sometimes in a distinct chamber, but whether they were occupying one ready made by some other insect, or whether they had made it themselves as larvæ, was not clear. Usually the pupæ seemed to be nearer the boundary of the Inclosure, while those in the larval stage were deeper in the wood. Possibly the former developed earlier, owing to the fact that more sunshine reached them. On May 25th I captured a male imago of *R. maculicollis* at the Black Pond, Esher Common, while an imago of the larger species (*R. notata*) was taken on the occasion of the South London Entomological and Natural History Society's excursion to Netley Heath (Surrey) on May 31st.

**Brown Lace-wings.**—In April Mr. Lyle gave me a specimen of *Heмерobius concinnus*, which he had bred from the larva. This he obtained when beating on April 16th. On the 18th it spun a very delicate cocoon of yellow silk with rather open meshes. In form the cocoon was a well-proportioned ellipse about 6 or 7 mm. long by 3 mm. wide. Pupation took place on the 30th, and the imago emerged between May 19th and June 9th, but was dead and stiff on the latter date. The pupa had left the cocoon by an irregular hole at one end. *H. quadrifasciatus* was taken on May 31st by Mr. A. Sich, on the occasion of the excursion of the South London Entomological Society to Netley Heath already mentioned. At Aviemore Col. Yerbury took

*H. nervosus* on May 27th and June 9th, and *H. stigma* on May 31st and June 11th. He also took *H. nervosus* at Woolhope, in Herefordshire, on September 7th. *H. micans* was captured in the New Forest on July 27th.

**Green Lace-wings.**—Very few were noted. They were: *Chrysopa perla*, on June 8th, in the Wisley district (Surrey); *C. tenella*, near Bedford, on June 15th; a large example of *C. flava*, on July 28th, amongst Scotch fir on Beaulieu Heath in the New Forest; *C. flava*, taken by Col. Yerbury on August 14th at Llangammarch Wells; *C. vulgaris*, in the New Forest on August 31st.

**Dusty-wings.**—On August 24th Mr. C. B. Williams and myself spent some time searching the holly leaves in the New Forest for *Coniopteryx psociformis*. We found egg, larva, cocoon, pupa, empty pupa-skin, and imago. The small white egg was laid on the margin of a holly-leaf, the mottled purplish brown larva was discovered on the under side of a leaf, in which situation also a number of white cocoons were found. The cocoon was double—a small one within a much larger one. From some the imago had emerged, leaving behind a delicate pupa-skin; but others contained the living pupa. The imago was taken on the wing. Mr. Williams has been breeding the British species of *Coniopteryx*, whose life-history was not well known, and the result of his experiments will be welcome reading.

**Scorpion-flies.**—On May 25th I met with the first example of *Panorpa*, a male *P. germanica*, at the Black Pond, Esher. In the Wisley district, on June 8th, *P. germanica* and a number of *P. communis* were taken. Mr. P. Richards sent me four *P. germanica*, from Seabrook, in Kent—an almost immaculate male taken May 2nd, another male on May 25th, and two females on May 20th; with them was a female *P. communis* taken on June 9th. Col. Yerbury took a female *P. communis* at Llangammarch Wells on July 22nd, and a female of the scarce *Panorpa cognata* at the same place on August 23rd.

Kingston-on-Thames: May, 1914.

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## THE ENTOMOLOGY OF HELIANTHUS.

By T. D. A. COCKERELL.

THE relations between insects and plants are of interest not only to the economic entomologist or the collector desiring to know where he can find rare species, but also to the general student of evolution, who sees in them an endless series illustrating various kinds and degrees of adaptation. In modern times, when so many plants are being purposely or accidentally

carried far beyond their original territory, exceptionally good opportunities arise for comparing the insects frequenting them in their native lands with those in places where they are aliens, without their normal insect enemies and allies. Work of this kind requires observers in different countries, as it rarely happens that a single individual can travel sufficiently to make the necessary observations. The writer in the course of his work on *Helianthus* is collecting all available data regarding the insects visiting or attacking sunflowers, and the object of the present discussion is to arouse interest and (it is hoped) secure some co-operation.

As an illustration of the work which may be done even by one who is no entomologist, I will describe the collection made by Mrs. Maybanke Anderson at Pittwater, New South Wales, during the winter (Australian summer) of 1913-14. Mrs. Anderson grew some of the new "red" annual sunflowers, derived from a cross between the red variety of the wild *Helianthus lenticularis* and the garden *H. annuus*. Her material was heterozygous, and of eight plants raised two were red and six had yellow rays. When they came into flower, "bees began to visit the flowers at once, some from our own hive [*Apis mellifera*; two sent, neither had collected pollen], and many of what we call the native bee [*Trigona carbonaria*, Smith; four sent]. Ants [*Iridomyrmex itinerans*, Lowne, var. *depilis*, Forel, det. Wheeler] from a nest of small black ants are always on the plants, but seldom, if ever, on the flowers. They are always busy in the edge (hairy) of the young green leaves or in the joints. John [assistant in the garden] tells me he has seen one carrying pollen. I have never seen one on a flower. There is a small fly [*Psilopus* sp.] with iridescent wings, who seems to stand high on his legs, who is seen there often, many of him. He is hard to catch. There is a green flying creature [a Fulgorid, *Siphanta acuta*, Walker], a pretty thing, who squeezes himself in between the swelling seeds. He also is very clever at getting away." Several other miscellaneous insects were captured and sent, including another Fulgorid, *Oliarus*, probably *O. asaica*, Kirk., but perhaps new; two other flies, one apparently a *Phormia*, but species new to me; the other a minute thing close to *Sepsis*; two beetles, a Chrysomelid, and a small hairy Coccinellid; also two spiders, one of them an Attid.

Thus we see that even in Australia, where no *Helianthus* is native, the plant attracts a considerable series of insects, which on the whole (especially the bees and ants) behave exactly as do their representatives in America. The *Trigona* workers had collected pollen, and were apparently making full use of the flowers, although no *Trigona* exists within the natural range of the *H. annuus* group. At Boulder, Colorado, we find Homoptera (*Publiva modesta*, Uhler, and *Ceresa bubalus*, Fabr.) on our



sunflower plants. We also find Coccinellids (especially *Hippodamia convergens*, Quér.) and Chrysomelids (*Chrysomela exclamationis*, Fabr.).

Are we then to conclude that the American insect fauna, which seems to be specially adapted to *Helianthus*, is in reality not so at all? That all these insects are in a general way adapted to plants of this type, or even to plants in general, and special, precise adaptations do not exist? By no means; there are in America numerous special sunflower insects, whose place cannot be truly occupied by alien species; but, nevertheless, it is evident that the majority of the species which may be collected from *Helianthus* are only loosely adapted to it, and could get along very well were this particular genus to become extinct.

It will be noted that Mrs. Anderson mentions no butterflies. Until I came to investigate the subject, I supposed that sunflowers were freely visited by butterflies, to the needs of which the long tubular corollas seem specially fitted. Observations on the red sunflowers in my garden at Boulder did not confirm this idea. On July 30th I saw one *Basilarchia weidemeyerii*, Edw., on the flowers. It was especially noticeable that the introduced species, *Pieris rapæ*, L., which abounded in the garden would fly among and over the sunflowers, never visiting them, although it would visit *Gaillardia*. On September 10th, in Boulder, I saw a *Colias eurytheme*, Bdv., visit a wild *H. lenticularis* for an instant, and then go to a *Grindelia*.

Dr. Max Ellis informs me that at Vincennes, Indiana, he took *Junonia cœnia*, Hb., at flowers of garden *H. annuus*.

Dr. H. Skinner, of Philadelphia, who has had so much experience with butterflies, writes me that he cannot recall a single instance of butterflies visiting sunflowers. Mr. Geo. Wheeler writes me that *H. annuus* in English gardens is frequently visited by *Pyrameis atalanta*, L., but he has never seen any other butterfly on it, and it is useless in his experience as an attraction for moths. (It does attract some moths at Boulder; e.g. *Stibadium spumosum*, Grote.) M. Buysman writes that he has not seen any insects visiting *Helianthus* at the Botanical Garden, Lawang, Java, but "perhaps the almost incessant rain is the cause." Knuth cites seventeen species of Lepidoptera, all but three being butterflies, from flowers of *Helianthus* in America; but these are all from the perennial sunflowers, *H. tuberosus*, *grosseserratus*, *divaricatus*, *mollis* and *strumosus*. Graenicher adds, from Wisconsin, twelve Lepidoptera (nine butterflies) at flowers of *H. strumosus*, and three butterflies at *H. giganteus*. Thus it appears that, while the perennial species are quite freely visited, the annual ones are so rarely, in America or Europe; though no doubt careful observations will bring to light a long list of instances.

When we come to Lepidoptera feeding on the plant as larvæ,



there is a very different story to tell. At Boulder, on our red sunflowers, we have found larvæ of different kinds feeding exposed on the leaves, folding the leaves, mining the leaves, burrowing inside of receptacles, feeding on the unripe seeds, and feeding on the disc florets. Are all such absent in Europe? Mr. A. G. Scorer, in his 'Entomologist's Log-Book' (1913), fails to mention a single species attacking *Helianthus*.

The following are some of the more important or interesting insect enemies of *Helianthus annuus* (including *lenticularis*, which is the wild representative of *annuus*).

#### LEPIDOPTERA.

##### *Phyciodes ismeria*, Bdv. & Lec.

This is identical with *P. carlota*, Reak.; Mead (1875) refused to recognise *ismeria*, on account of the rather poor description, but it really seems to apply to our species. The larvæ are common on the sunflowers at Boulder, and the species extends eastward across the plains into Nebraska, becoming rare as far east as Omaha, according to R. A. Leussler.

The larvæ exist in two colour varieties as follows:—

- (1) A row of large subquadrate dark orange spots down back; subdorsal region black, speckled with creamy white; sides pallid, with a broad reddish band, the spiracles enclosed in angular elongated grey-black patches spotted with white; under side dark; dorsal and subdorsal spines black, but lateral ones pale; head shining black. Larva about 20 mm. long, found by my wife August 17th; pupated about August 22nd; imago August 31st.
- (2) Entirely orange-red with black spines and dusky subdorsal and lateral bands (the lateral bands just above bases of legs); head shining black. Larva about 21 mm. long, found by my wife August 22nd; imago September 5th.

The original *P. ismeria* fed on a perennial sunflower, *Helianthus tracheliofolius*, and probably came from North Carolina. It is perhaps probable that the butterfly will be found to have two distinct subspecific forms, one (true *ismeria*) of North Carolina and adjacent regions, feeding on perennial sunflowers; the other (subsp. *carlota*) of the Rocky Mountain region, feeding on annual sunflowers. The former was said by Boisduval and Leconte to be very rare in collections, and it appears still to be so, as I have never seen a specimen, and the Academy of Natural Sciences at Philadelphia has none. The latter is abundant along the eastern foothills in Colorado, and goes north (*vide* Dr. H. Skinner, in litt.) to Manitoba, where it is taken at Beulah as early as May 24th, and Stony Mountains, June 11th. Dr. Skinner also tells me that the Philadelphia Academy has one from as far east as Minneapolis, Minnesota, taken May 25th.

*Synchlœ lacinia*, Geyer.

This polychroic Nymphalid takes the place of *P. ismeria* in southern New Mexico and adjacent northern Mexico, where the larvæ abound on sunflowers. A good account was given by W. H. Edwards in 'Canadian Entomologist,' Nov. 1893, pp. 286-291. It chanced that Edwards had at the same time eggs and larvæ of *F. ismeria* (*carlota*) from Montana and Colorado. He found the eggs, and larvæ in first two stages, of the two species "in no way distinguishable." In later stages they are alike in shape and armature, but differ in coloration. However, the pupa of *S. lacinia* is closely like that of *Melitæa baroni*, and is not like that of *P. ismeria*, which is typical of *Phyciodes*, like *P. tharos*. As to the differences in the colours of the larvæ, it will be seen from the above account that *P. ismeria* presents two varieties, and these nearly correspond to two varieties of *S. lacinia*. *S. lacinia*, interpreted in the broad sense as a variable species, goes south to Peru and Bolivia, but I have no information about its habits in those regions.

## DIPTERA.

*Tephritis finalis*, Loew.

This Trypetid, kindly determined for me by Mr. F. Knab, breeds in numbers in the heads of our red sunflower at Boulder, Colorado. The species is widely distributed, from Idaho and South Dakota, west to California, and south to Orizaba, Mexico. It might by some accident be introduced into Europe (*e.g.* Russia) and there become a formidable pest; precautions should be taken to prevent such an occurrence.

Another Trypetid, *Strauzia longipennis*, Wied. (det. Knab), was found in Boulder on the sunflower plants, but it is not as yet known to feed upon them.

## COLEOPTERA.

*Dectes alticola*, Casey.

In October, 1913, my wife found in a head of the red sunflower a creamy white Coleopterous larva with large humps on the body. It was sent alive to the National Museum in Washington, and Mr. Craighead placed it in the stem of a chrysanthemum, and thus very cleverly succeeded in raising the adult, which was determined as *D. spinosus*, Say. Just about this time, however, Casey published his *D. alticola*, a segregate from *D. spinosus*, readily recognisable by the black humeral spots. The Boulder species, which I had earlier taken in the adult state (July 18th), is *D. alticola*. True *D. spinosus* is from the Eastern States, and Mr. Craighead very kindly sent me a pair of these, which he has bred from stems and roots of ragweed.

*Chrysomela exclamationis*, Fabr.

This is extremely abundant in all stages on the red sunflowers at Boulder, and is a great pest. The larvæ void their excrement when touched, and are probably avoided by birds. The beetles are, however, attacked by the Hemipteron *Perillodes claudus*, Say, which resembles them to a certain extent in its colour-scheme. Fabricius published *C. exclamationis* in 1801, stating that it was obtained by D. Smith Barton in North America. This was evidently Benjamin Smith Barton of Philadelphia; how he obtained this western insect in 1801 I do not know, but the description of Fabricius seems clearly applicable. Mr. F. Knab has very kindly copied out for me all the localities for *C. exclamationis* in the U.S. National Museum, the Hubbard and Schwarz collection, and the Knab collection. The most eastern localities are in South Dakota (Aberdeen, R. A. Vickery; Volga, Truman); Kansas (Riley Co., Popenoe; Topeka, Hubbard and Schwarz; Onaga, F. F. Crevecœur); Nebraska (Lincoln, H. Soltau; West Point); and Texas (Dallas, Boll). One specimen is labelled "Pennsylvania," from the collection of C. V. Riley, but, as Mr. Knab says, this is surely a mistake.

One specimen is said to come from Arizona (from collection of J. B. Smith), but there are none from the Pacific coast region, where I incline to believe that *Helianthus lenticularis* is not truly indigenous.

There are in addition some very characteristic sunflower weevils (especially *Desmoris constrictus*, Say, and *D. fulvus*, Lec.), but my materials have not yet been fully examined.

## HEMIPTERA.

*Aphis helianthi*, Monell, occurred in quantity on leaves of the red sunflower in my garden at Boulder; but I also obtained a species of *Macrosiphum*, a new genus for *Helianthus*. Specimens of this were kindly examined by Professor C. P. Gillette, who reported that he could not distinguish them from *M. ambrosiæ*, Thomas.

The predatory bug *Phymata fasciata*, Gray, was found at Boulder on the red sunflower, preying on the honey bee, *Apis mellifera ligustica*, Spin.

## THYSANOPTERA.

A thrips abundant on heads of the red sunflower at Boulder was carefully examined by Miss Elizabeth Robinson and the writer. We could not distinguish it in any way from the common *Frankliniella tritici*, Fitch.

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# A NEW SCELIONID PARASITE OF LOCUST EGGS FROM THE NORTHERN TERRITORY OF AUSTRALIA.\*

By A. A. GIRAULT.

THE following species was received from Mr. G. F. Hill, Government Entomologist, Northern Territory, Australia.

Genus *SCELIO*, Latreille.

## 1. *Scelio semisanguineus*, n. sp.

*Female*.—Length 3.20 mm.

Blood red, the head, abdomen and distal six joints of antennal flagellum, black; joints 5 and 6 of antennæ suffused with blackish; segments 2-5 of abdomen suffused more or less with reddish, ventrad and dorsad. Distal half of fore wings rather deeply infuscated. Scape long, about equal to the next six joints; pedicel somewhat longer than joint 3 which is somewhat longer than wide at apex; following joints wider than long, 7 longest of them, 5 and 6 shortest. Mandibles very long, strongly bidentate at apex, the teeth subequal; maxillary palpi 3-jointed. Venation faint. Segment 4 of abdomen distinctly longer than the two preceding segments; segments 2 and 3 of abdomen with longitudinal striæ more or less anastomosed; segments 4 and 5 densely polygonally reticulated, the lines raised; 6 striated like 3, also the entire venter; segment 5 with the striation along distal half. Thorax umbilicately punctate, the punctures unequal in size, smallest on propodeum; the latter also obliquely longitudinally striate but not densely, two of the striæ down the meson as median carinæ which are separated for some distance. Lateral margin of propodeum and the shoulders fringed with silvery pubescence. Parapsidal furrows complete, rather distinct. Head coarsely punctate and with short silvery pubescence.

*Male*.—Unknown.

Described from five females labelled "No. 31, Botanic Gardens, Darwin, N. T., Feb. 13, 1914, G. F. Hill," and captured over acridid egg-beds on sandy soil.

*Habitat*.—Australia: Port Darwin, Northern Territory. Associated with Acridiidae.

*Types*.—Queensland Museum, Brisbane, five females on a tag.

## NEW AUSTRALIAN BEES.

By T. D. A. COCKERELL.

### *Euryglossidia purpurascens*, sp. n.

♂. Length about 8½ mm.; black, the abdomen dark rich chestnut-red, suffused with purple, the basal segment dark; antennæ black, extremely long, reaching to third abdominal segment; head

\* Contribution No. 24, Entomological Laboratory, Bureau of Sugar Experiment Stations, Bundaberg, Queensland.



broad; mandibles black; clypeus shining, with sparse distinct punctures; supraclypeal area dullish, appearing minutely granular, contrasting with clypeus; hair of head and thorax mainly white, but there is fuscous or black hair on clypeus, vertex, and discs of mesothorax and scutellum; mesothorax dull, without evident punctures; scutellum a little more shining, slightly bigibbous; area of metathorax large, with only microscopical sculpture; tegulae piceous, with a large testaceous spot posteriorly; wings strongly infuscated, brownish; the large stigma dark reddish; nervures fuscous; b. n. falling far short of t. m.; lower side of first s. m. with a gentle double curve; first r. n. joining second s. m. at a distance from base equal to length of first t. c.; legs black basally, red apically, the black ending on femora, near middle on anterior ones, near apex behind, but at middle or before in front, on the other ones; middle and hind tibiae with a dusky suffusion on outer side; abdomen broad basally, not clavate, not punctured; apical plate circular, its margin broadly translucent.

♀. Length about 9 mm., much like the male, but antennae short, ordinary; supraclypeal area elevated, smooth and shining; sides of second abdominal segment with a large dark spot; apical fimbria dark fuscous, not very large.

*Hab.* Yallingup, S.-W. Australia, September 14th–October 31st, 1913, 1 male (= type), 2 females (R. E. Turner); British Museum. The three species of *Euryglossidia* now known may be separated thus:—

Wings hyaline, nervures ferruginous (W. Australia)

*ichneumonoides* (Ckll.).

Wings brownish . . . . . 1.

1. Nervures ferruginous; second s. m. receiving first  
r. n. at a distance from base equal to about half  
of first t. c. (Victoria) . . . . . *rectangulata*, Ckll.

Nervures fuscous; second s. m. receiving first r. n.  
at a distance from base equal to length of first  
t. c. (W. Australia) . . . . . *purpurascens*, Ckll.

All three show more or less purple lustre on abdomen, at least in the male. The species now described is considerably larger than the others.

### *Euryglossa undulata*, sp. n.

♀. Length about 10 mm.; robust, black, the head and thorax with rather scanty dull white hair, the end of the abdomen with dark fuscous hair; head broad; mandibles black, with a broad bright ferruginous subapical band; clypeus shining, with scattered distinct but not large punctures; flagellum beneath dark brown with pallid bands or spots, one to each joint; mesothorax dull, microscopically tessellate, with irregular shallow punctures, sparse on disc; scutellum more shining, with scattered large punctures, and a very fine median impressed line; area of metathorax large, shining, with only microscopical sculpture; tegulae rufopiceous; wings smoky-hyaline, nervures and stigma piceous; b. n. meeting t. m.; lower side of first

s. m. very strongly arched or undulated; legs dark reddish brown with glittering white hair; anterior knees and tibiae in front yellow; abdomen broad, first segment with a large yellow patch (bidentate posteriorly) at base; second to fourth segments with interrupted yellow bands, which become very broad in the sublateral region; second and third segments dull basally, shining apically; apical plate small; greater part of venter yellow.

♂. Length 8 to 9 mm.; much more slender; face and front with much white hair, but not hiding the surface; flagellum beneath dark coffee-brown, not spotted; b. n. not reaching t. m.; all the femora yellow at apex; anterior tibiae yellow with a large black patch behind; middle and hind tibiae yellow at apex behind; first abdominal segment not yellow at base; second to fifth with transverse yellow maculae, successively smaller, at sides, those beyond the third segment sometimes hidden by the retraction of the segments; apical plate circular, orange-fulvous; venter mainly yellow.

*Hab.* Yallingup, S.-W. Australia, September 14th–October 31st, 1913, 1 female (= type), 3 males (R. E. Turner); British Museum. The sexes were taken mated on September 30th. The female is superficially rather like *E. crabronica*, Ckll., but differs by the dark face, venation (first r. n. entering second s. m. some distance from base, second r. n. a short distance from apex), &c. *E. maculata*, Sm. (of which *E. villosula*, Sm., is probably the male, judging from the descriptions), has yellow legs, while *E. nitidifrons*, Sm., has yellow mandibles.

*Binghamiella insularis*, sp. n.

♂. Length about 7 mm.; rather slender, black; first abdominal segment black or nearly, with the apical margin broadly red; rest of abdomen bright chestnut-red, with the apical margins of the segments stained with dusky; face with white hair, not dense. Compared with female *B. antipodes* (Smith), from New South Wales, the following differences are apparent: abdomen a much brighter red; wings dusky, not so red (very red in *antipodes*), with the stigma and nervures piceous; third s.m. broader above than second (the reverse is true of *antipodes*); mesothorax extremely densely punctured. Apical plate of abdomen very small and narrow; antennae wholly dark; flagellum very long, reaching to end of thorax; lobes of tongue quite long and slender.

*Hab.* Eaglehawk Neck, S.-E. Tasmania, February 12th–March 3rd, 1913 (R. E. Turner). Two males. British Museum. As we know only the male of *B. insularis* and the female of *B. antipodes*, it is difficult to determine the true specific characters of the new form, but it seems to be sufficiently distinct.

*Exoneura turneri*, sp. n.

♀. Length about 8 mm.; head and thorax black, wholly without light markings; abdomen bright chestnut-red, the first segment with two rather small dusky spots near base; femora, tibiae, and tarsi bright chestnut-red, anterior femora black at extreme base;

mandibles with a very obscure reddish spot; face broad, orbits practically parallel; scape with a narrow red stripe in front; flagellum dark; tegulæ piceous; wings strongly reddened; mesothorax very smooth, polished; hair of hind tibiæ and tarsi rufo-fulvous.

*Hab.* Eaglehawk Neck, S.-E. Tasmania, February 12th–March 3rd, 1913 (R. E. Turner). Two females. British Museum. Allied to *E. hamulata*, but distinguished by the entirely black face. It is perhaps not more than a local race of *hamulata*.

*Exoneura angophoræ occidentalis*, subsp. n.

♀. Length  $6\frac{1}{2}$ –7 mm.; face wholly without light markings; face narrowed below; scape red or yellowish-red in front; wings reddish; anterior and middle femora above, and below apically, and their tibiæ and tarsi entirely, bright ferruginous; hind legs black, the femora and tibiæ narrowly red at apex; hind tibiæ and tarsi with much fuscous hair; basal segment of abdomen black except the apical margin, the hind border of the black obtusely bilobed; second segment with a broad biundulate dusky band.

*Hab.* Yallingup, S.-W. Australia, September 14th–October 31st, 1913 (R. E. Turner). Four females. British Museum. Mr. Meade-Waldo notes:—"Not *E. bicolor*; differs in colour of hind legs, &c." It is, however, so close to *E. angophoræ* that I treat it as a subspecies.

*Exoneura insularis*, sp. n.

♀. Length about 6 mm.; black, including the abdomen; orbits moderately converging below; clypeal and lateral marks cream-colour; clypeus with a very broad median band, which suddenly broadens above, so as to include all of upper part of clypeus; lateral marks rather small, subtriangular; scape with a red mark near base, and one at apex; flagellum thick, very obscure reddish beneath; tubercles black, with white hair; pleura and sides of metathorax with thin white hair; tegulæ piceous; wings reddish, nervures and the large stigma dull ferruginous; legs black, anterior tibiæ obscure reddish at base and subapically; hair of hind tibiæ and tarsi black; abdomen very broad.

*Hab.* Stradbroke Island, Queensland, September 24th, 1906 (W. W. Froggatt, 155). Allied to *E. botanica*, but easily separated by the lateral face-marks and dark tubercles.

*Allodape bribiensis*, sp. n.

♀. Length about 4 mm.; black, the abdomen dullish, not shining as in *A. unicolor*; eyes greyish-green; clypeus with a broad white vertical bar, narrowest at top, and gradually widening downwards; scape black; flagellum ferruginous beneath, except at base; mesothorax shining; tegulæ testaceous; wings moderately dusky; nervures and stigma dusky reddish; tubercles white; anterior femora with two white spots at apex, their tibiæ brown with a white line on outer side; middle tibiæ with a white spot at base;

posterior tibiæ with more than the basal half broadly white posteriorly; hind margins of abdominal segments more or less reddish, but very narrowly and obscurely.

*Hab.* Bribie Island, Queensland, November 2nd, 1913 (H. Hacker; Queensland Museum, 112). Nearest to *A. unicolor*, but smaller, with different clypeal mark, and white marks on the legs.

## NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### *Bapta conspersa*, sp. n.

♂. Head white, face brown; antennæ brown, white at base; thorax and abdomen white, the latter speckled with grey. Fore wings obtusely pointed at apex, white speckled with grey, costa narrowly ochreous; discoidal dot black; antemedial and postmedial lines grey, the former slender and only distinct towards dorsum, the latter diffuse, curved and recurved. Hind wings white speckled with grey; discoidal dot minute, black; postmedial line grey, narrower than that on fore wings. Fringes and under side of all the wings, white.

Expanse, ♂, 33 millim.; ♀, 35 millim.

Collection number, 778.

One example of each sex. The male from Daitozan (8500 ft.), September 17th, 1906, and the female from Arizan, August 21st, 1908.

### *Bapta marginata*, sp. n.

♂. Head white, face brown; antennæ brown, white at base; thorax and abdomen white powdered with grey. Fore wings white, thickly powdered with grey on the basal area, which is limited by the slightly darker and almost straight antemedial line; postmedial band grey, fairly parallel with termen; a broad grey band on terminal area; discoidal dot black. Hind wings white, basal two-thirds finely powdered with grey; terminal third grey, traversed by a narrow band of ground colour; discoidal dot black. Fringes and also the under side of all the wings, white.

Expanse, 36 millim.

Collection number, 778b.

A male specimen from Arizan (7300 ft.), August 22nd, 1908.

### *Pseudomicronia fasciata*, sp. n.

♂. Head, thorax, and abdomen white, the latter faintly brownish-tinged. Fore wings white with nine slightly oblique fuscous grey transverse lines, the third and fourth bifurcate towards the costa, the fifth and sixth approximate on dorsum and diverge towards costa, where they enclose a fuscous grey transverse streak; all the lines are blackish on the costa and have short blackish linear marks between them; a fuscous grey band just beyond the fourth line; terminal



line blackish. Hind wings white with four fuscous grey transverse lines, one before the fuscous grey band (which is broader and more oblique than on the fore wings), and three, united below middle, beyond the band; two black spots at angle; terminal line blackish. Under side white.

Expanse, 43 millim.

Collection number, 781.

A male specimen from Kanshirei, June 11th, 1906.

Allied to *P. cœlata*, Moore.

*Arichanna postflava*, sp. n.

♂. Head, thorax, and abdomen grey. Fore wings grey with some blackish clouds at the base and three transverse series of black spots; first series of four spots—two on costal area, one below median nervure, and one just above the dorsum—represent an irregular antemedial band; second series of seven spots—three on costal area, and four on dorsal area (5 and 6 confluent)—represent a curved and recurved postmedial band; third series of nine spots—5 faint, 7 and 8 confluent—indicate a band almost parallel with the termen; discoidal spot black. Hind wings yellow, grey on the basal area; discoidal spot black; postmedial and subterminal bands represented by black spots of irregular size, the spots of each series confluent on dorsum. Under side similar to above.

Expanse, 66 millim.

Collection number, 772.

A male specimen from Daitozan (8500 ft.), September 11th, 1906.

Comes near *jaguarinaria*, Oberthür.

*Percnia suffusa*, sp. n.

♂. Head and thorax brownish grey, the latter with two rows of black dots; abdomen grey, two black dots on each segment. Antennæ serrate and fasciculate. Fore wings white suffused with brownish grey on basal third and along the costa; two black dots at base and six spots representing subbasal and antemedial lines, all spots placed on veins; discoidal spot black, rather large; postmedial line sinuous, formed of black dots on the veins, outwardly broadly suffused with dark grey; subterminal and terminal lines formed of black dots between the veins, the space enclosed suffused with dark grey. Hind wings white, finely sprinkled with brownish grey on basal area; antemedial line represented by blackish spots on the veins; discoidal spot black, rather large; postmedial, subterminal, and terminal lines as on fore wings. Fringes of all wings white. Under side white, discoidal spot and transverse markings beyond as on the fore wings; apical area of fore wings darkened.

Expanse, ♂, 48 millim.; ♀, 50 millim.

Collection number, 812.

A male and a female from Kanshirei, April 29th, 1908, male; June 22nd, 1906, female.

This species comes near *P. maculata*, Moore.

*Anticlea taiwana*, sp. n.

Head and thorax blackish; antennæ bipectinated; abdomen brown, blackish at base. Fore wings pale brown slightly suffused with fulvous on the disc; basal fourth blackish, limited by a brownish line; antemedial line brownish, preceded by a double dusky line, which, together with antemedial, terminates in a black mark on the dorsum; postmedial line serrate, irregular, indicated by a series of partly black-edged white dots on the veins which towards the costa are connected by a slender black line; some indistinct and irregular lines before the postmedial, and a series of black dots on the veins beyond the postmedial; subterminal line blackish, undulated, only distinct towards costa where it is inwardly edged with blackish mixed with brown and outwardly bordered with greyish white and dark grey, and above tornus where it has a blackish mark on its inner edge; discoidal mark blackish linear. Hind wings fuscous. Fringes of all wings brown, chequered with darker. Under side fuscous, two darker transverse lines on each wing.

Expanse, 28 millim.

Collection numbers, 817, female, and 1694, male.

One example of each sex from Arizan (7500 ft.), September 13th, 1906, female; August 30th, 1908, male.

The transverse lines are not very distinct in either of the specimens, but they are rather better defined in the female than in the male.

## CONTINENTAL ODONATA AND NEUROPTERA, 1913.

By W. J. LUCAS, B.A., F.E.S.

MR. W. G. SHELDON was kind enough to give me a number of Odonata and Neuroptera taken in France and Spain in the summer of 1913. They were:—

**Odonata.**

*Libellula depressa*, Linn., Biarritz, June 25th, a nice deep-coloured male.

*Orthetrum cærulescens*, Fab., Biarritz, June 27th, a fragmentary male. Albarracin, June 13th, a female. Another female, with incomplete data.

\**Onychogomphus uncatus*, Charp., Albarracin, June 6th, a male. Albarracin, June 17th, a male and a female. Biarritz, June 25th, a female. All four were in somewhat teneral condition.

*Calopteryx virgo*, Linn., Biarritz, June 25th, a male with broad wings, blue to the tip.

*Calopteryx splendens*, Harr., Albarracin, June 7th, one male with the blue colouring only just commencing to show its position on the wing. Albarracin, June 16th, a male in condition similar to the last; a male without any sign of blue appearing on its wings; two females. They must be referred to the race or variety *xanthostoma*, Charp.

\**Calopteryx haemorrhoidalis*, Vanderl., Biarritz, June 24th, a male with teneral colouring; June 25th, two males, one fully coloured, the other teneral, and a female not strongly coloured.

*Cordulegaster annulatus*, Latr., Biarritz, June 27th, a female.

*Platynemis pennipes*, Pall., Biarritz, June 27th, two females in poor condition.

*Pyrrhosoma nymphula*, Sulz., Albarracin, May 28th, a teneral female; June 13th, a male and a female, the latter teneral.

*Agrion mercuriale*, Charp., Albarracin, June 13th, a male. Biarritz, June 23rd, a female, June 25th, a male and female *in cop.*, and June 27th, a teneral male.

### Neuroptera.

\**Ascalaphus longicornis*, Linn., Albarracin, about mid-June, a male.

\**Ascalaphus beticus*, Ramb., Albarracin, about mid-June, a male.

\**Ascalaphus hispanicus*, Ramb., Albarracin, about mid-June, a male—an interesting species less frequently obtained than the previous two.

\**Creagris plumbeus*, Oliv. (an ant-lion), Albarracin, June 13th, a female.

Those species with an asterisk (\*) prefixed do not belong to the British fauna.

Kingston-on-Thames: May, 1914.

## NOTES AND OBSERVATIONS.

GYNANDROMORPHOUS BRED SPECIMEN OF CATOPSILIA (CALLIDRYAS) CROCALE.—I had been breeding a good many specimens of *C. crocale*, when I noticed, to my astonishment, that one recently hatched out to-day had the right wing like a male, while the left wing was like a female. I showed the butterfly to Miss Fountaine, who at once told me it was an hermaphrodite and a great prize for me to have secured, saying that amongst several hundred specimens, including a number of different species of *Callidryas* bred by herself in various parts of the world, such a thing had never occurred. Unfortunately the butterfly was lying on its back at the bottom of the cage when I found it, so that at the root of the fore wings it is deformed, but otherwise well-developed.—R. L. HUNTER; Barron Falls Hotel, Kuranda, North Queensland, April 29th, 1914.

PACHYS (AMPHIDASYS) BETULARIA ab. DOUBLEDAYARIA IN BERKSHIRE.—On May 22nd I took a female specimen of *P. betularia* var. *doubledayaria* on a door-post. I think it interesting to record this, because I believe this form is not very often taken in the Reading district.—H. L. DOLTON; 36, Chester Street, Reading, Berks.

MYELOPHOLA (MYELOIS) CRIBRUM IN NORTH-WEST LONDON.—In 1907 I recorded the occurrence of this species at Upper Tooting

on July 14th of that year (Entom. xl. p. 213). This was followed by other records of the species from the same district, also from Thornton Heath and from Kingston (Entom. xl. p. 237). I have now to put on record the capture of two specimens at Brondesbury. The moths, which were captured by Mr. Alec Urquhart, flew to the electric light in one of the lower rooms here at about 11 p.m. on June 18th last.—RICHARD SOUTH; 4, Mapesbury Court, Shoot-up-Hill, Brondesbury, N.W.

ACHERONTIA ATROPOS IN KENT.—I had a male specimen of *A. atropos* brought to me on June 15th ult. It was flying, about 9.40 in the morning, and was knocked down by the captor, consequently it is somewhat rubbed.—PERCY RICHARDS; Seabrook, Hythe.

PLUTELLA MACULIPENNIS (CRUCIFERARUM) ABUNDANT.—*P. cruciferarum* is a veritable nuisance just now. It occurs everywhere in this district in thousands. I wonder if this abundance of the species is general throughout the South of England?—PERCY RICHARDS; Seabrook, Hythe, June 17th, 1914.

[When in Scarborough recently I noted *P. maculipennis* in some numbers on the cliffs on June 9th and 10th, but on the moors above Goathland on June 11th the species was exceedingly common.—R. S.]

LYTHRIA PURPURARIA.—While examining recently a small collection of unnamed Lepidoptera, made by a schoolboy at Meads, near Eastbourne, in the years 1902-3, I was astonished to find amongst them a specimen of *Lythria purpuraria*. It is not quite typical, having the dark cross-bars very broad, as well as being under the normal size. With the exception of the *L. purpuraria*, all the specimens are of very common species; all are pinned with large white English pins, and "set" in the usual schoolboy style, and all are in very bad condition. Under the circumstances, I cannot but regard the specimen as a genuine British example of this species. It is now in the possession of a son of Dr. Rowland, of Lichfield, to whom the collection was given by the captor—a son of Dr. Homan, also of this city.—L. A. CARR; Lichfield, May 29th, 1914.

ZYGÆNA TRANSALPINA, Esp., var.—I think it may be worth while to record the capture, on August 4th last, of a variety—or aberration—of *Zygæna transalpina*, Esp., to which I can find no parallel noticed in any works that I have been able to consult. There is no similar specimen in the collections in South Kensington or in Oxford. The distinguishing feature consists in the absence of the lower of the two usual red spots of the *central* group on the fore wings. (The absence of one of the *outer* group of spots appears to be not very infrequent in allied species, though I do not remember having seen any such variety of *transalpina*.) The specimen, which is a male, was taken on the shores of the Oeschinen-See (about one-and-a-half hour's walk from Kandersteg); and as I did not notice its peculiarity at the time, and *Zygenas* were swarming, I did not work for more. I was for some time uncertain to which species to assign it, but inclined towards *transalpina*, and this identification



has been confirmed by Dr. E. A. Cockayne, who kindly examined the specimen for me.—A. W. PICKARD-CAMBRIDGE; Balliol College, Oxford.

EARLY APPEARANCE OF *EUCHLOË CARDAMINES*.—The first "Orange Tip" I saw this season was on April 22nd. The specimen was a male, and it was flying along a hedgerow within a mile of Chester. The species is unusually common in the district this year.—J. ARKLE; Chester.

With reference to the early appearance of *Euchloë cardamines* this year, it may be of interest to note that I first saw it on April 18th. Last year it appeared on April 23rd, in 1912 on April 19th, and in 1906 on April 9; but the latter was at Chudleigh, S. Devon. I saw a male *Colias edusa* at Groombridge on May 16th.—E. D. MORGAN; 24, Queen's Road, Tunbridge Wells, Kent, May 6th, 1914.

I noted *E. cardamines* at Tonbridge on April 12th last.—P. A. BUXTON; Trinity College, Cambridge.

BUTTERFLIES OF VENICE AND NEIGHBOURHOOD.—Being at Venice in the middle of April this year, and my interest in the butterflies of the neighbouring Lido having been aroused by Mr. Gurney's article (Entom. xlv. p. 232), I took my net to this island, anxious to see what this early time of year might afford in the way of butterflies. On April 20th, the Pierids *rapæ*, *napi* and *brassicæ* were common; also an exceedingly richly coloured form of *Pararge megæra* and *Cænonympha pamphilus*. *Erynnis alceæ* was not rare, beautifully fresh, and evidently just emerging. I saw one specimen of *Vanessa io*, exceedingly large and brilliant. The next day the weather began to get really hot, and "whites" were frequently seen flying over the canals of Venice herself. On the 22nd I again went to the Lido. The extra warmth since my last visit had brought out five more species, besides trebling the quantity of butterflies previously noted. *Polygonia c-album*, *Epinephele jurtina*, *Cyaniris argiolus* and *Nisoniades tages* had emerged; I had feared that I was too early for *Colias edusa*, but I at last came across a fine fresh female, which I took after an exciting chase. The moth *Ematurga atomaria* was taken also. A few locusts were flying about, causing a peculiar metallic-like sound. One settled on a branch within a few yards of my head, so that I got a good look at it. I think it was *Acridium peregrinum*. It is interesting to note that nine out of the twelve species of butterflies which I came across on the Lido in April were met with by Mr. Gurney in September. This suggests that there must be at least three broods of most of these species. All along the railway line through Venetia and Lombardy, on my way from Venice to the Italian Lakes, I kept a sharp look-out for insects. Amongst numerous Pierids, Nymphalids and "blues," the most conspicuous (beyond the usual "whites") were *Euchloë cardamines*, *Leucophasia sinapis* and *V. io*, with *C. edusa* quite common, and *C. hyale* almost everywhere. In the clover fields bordering the line some distance past Verona, there appeared to be an orange-coloured *Colias*, like *C. myrmidone*; but of this I could not be absolutely certain. Is this

insect found in Northern Italy? It would interest me very much to know. I broke my journey at Verona, where *Papilio podalirius* hovered lazily over the flowers in the Piazza Indipendenza. This insect, together with *P. machaon*, was quite common at Lugano on May 2nd, selecting the very top of Monte San Salvatore as its chief playground. At this same elevation were *E. cardamines*, *P. megæra* and *Cupido minimus*, also a large *Argynnis* which I failed either to catch or identify. On the lower slopes of the mountain *P. napi*, *P. brassicæ*, *P. rapæ*, *E. cardamines*, *L. sinapis*, *C. minimus*, *P. icarus*, *Chrysophanus doris* var. *subalpina* and *V. io* were common, with an occasional *Melitæa athalia*, *M. aurinia* (?), *Argynnis euphrosyne*, worn *P. megæra* and *P. egeria* (the females of this species with the light spots enormous), and of course *P. podalirius*. On my homeward journey I saw nothing of interest except *Colias hyale* near Lucerne.—JOHN B. HICKS; Stoneleigh, Elmfield Road, Bromley, Kent, June 16th, 1914.

[There is no authentic record, I believe, of the occurrence of *C. myrmidone* in Italy, but it has been reported from Carinthia, and its area of distribution over S.-E. Hungary is wide.—H. R.-B.]

## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 14th, 1914.—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—Mr. B. S. Williams, on "The Thysanoptera," and showed lantern-slides and specimens under the microscope in illustration.—Mr. Hocking exhibited branches of the common furze from Danbury Common, which had been covered by a dirty white web and killed by an attack of countless numbers of *Tetranychus linteanus*, an extremely small mite which congregated in reddish brown dust like patches. Mr. Step had seen a similar attack of a mite on lime at Mickleham.—Mr. B. Adkin, aberrations of *Colias edusa*, including a male with very pale marginal bands one half the usual size, and a yellowish form of the var. *helice*.

May 28th.—The President in the chair.—Mr. Buckstone, one male and three female hybrids of the cross *Nyssia zonaria* male and *Apocheima hispidaria* female. The larvæ were very like those of the latter species and were constitutionally weak, only four imagines resulting from some three hundred fertile ova.—Mr. West (Greenwich), a specimen of the extremely rare Hemipteron *Pygolampis bidentata*, taken by him in the New Forest in May. Only one specimen had previously been captured in Britain.—Mr. Newman, a living pupa of *Strymon pruni*, which closely resembles bird's excrement.—Mr. Gahan, examples of a mealy-bug, both sexes of which had occurred two years running on flowering currant in his garden at Bedford Park. It was supposed to be *Pseudococcus citri*, a hot-house species.—Mr. K. C. Blair read a paper on "Luminous Insects,"

many examples of which were exhibited by himself, Messrs. Main, Edwards, and H. Moore.—HY. J. TURNER, *Hon. Rep. Secretary*.

April 9th.—*Correction*, p. 159, l. 12, for *Lita melanella* read *Lita leucomelanella*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — *April 20th, 1914.* — The President in the chair. — Mr. A. W. Boyd, M.A., F.E.S., gave an address entitled "The Natural History of Rostherne Mere." Having described the physical characters of the mere and the probable causes of its formation, the nature of the surrounding land and its flora, both arboreal and herbaceous, he dealt exhaustively with the birds known to frequent the mere, and finally the insecta of the locality were discussed. Several very interesting records have been made, *viz.*: *Acidalia circumcellata*, a fine female specimen in 1913, *Ornix avellanella*, *Laverna raschkiella*, this species being an addition to the Lancashire and Cheshire county list, and *Nepticula argentipedeella*. Mr. Boyd exhibited the Lepidoptera catalogued for the locality, and was congratulated upon having made such good use of the opportunity of collecting upon the private ground surrounding the mere. At the close of the address Mr. Boyd was heartily thanked for his kindness in coming from Manchester to give his experiences.—Mr. W. Mansbridge exhibited several xanthic varieties of *Fidonia atomaria* bred among a large number of the species from Burnley females. The xanthism was confined to the hind wings, and in most of the specimens it affected only one of the hind wings, in two instances, however, both the secondaries were nearly white all over.—Mr. F. N. Pierce exhibited generic types of the British Geomitridæ, arranged according to their affinities as indicated by the genitalia.—WM. MANSBRIDGE, *Hon. Sec.*

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## RECENT LITERATURE.

*Memoirs of the Queensland Museum.* Vol. i. (Nov. 27th, 1912), and vol. ii. (Dec. 10th, 1913.) Brisbane.

AMONG the papers of interest to entomologists in these volumes are a series on "Australian Hymenoptera Chalcidoidea," by A. A. Girault. Parts i., ii. and iii. are published in vol. i. (pp. 66-189). Parts iv., v. and vi., and Supplement to Parts i.-iii., appear in vol. ii. (pp. 101-334). A number of new genera are diagnosed, and very many new species are described. The families treated are: Trichogrammatidæ, Mymaridæ, Elasmidæ, Elopheidæ, Pecilampidæ, and Pteromalidæ.

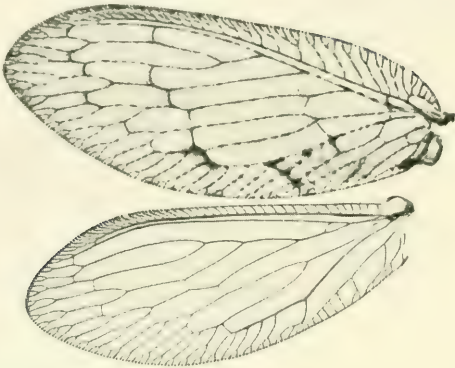
Another paper describing some new genera and species of South Queensland Proctotrypoidæ (vol. ii. pp. 335-339) is by Alan P. Dodd. There is also a short article entitled "Some Field Notes on Queensland Insects," by Henry Hacker (pp. 96-100).

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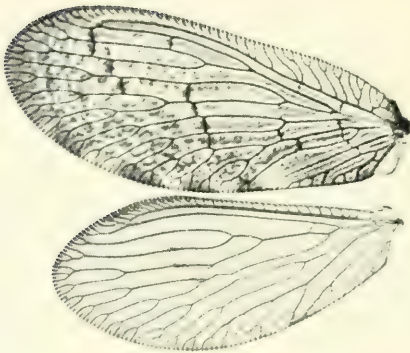




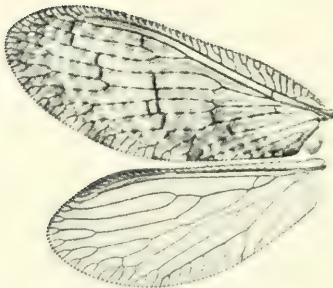
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HEMEROBIID WINGS.

Photo Dr. Fr. Ris.

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## NOTES ON THE BRITISH SPECIES OF *SYMPHEROBIUS* (*HEMEROBIUS*), INCLUDING ONE HITHERTO UNNOTICED.

By KENNETH J. MORTON, F.E.S.

(PLATE V.)

In the Trans. Am. Ent. Soc. xxxii., December, 1905, pp. 28-29, Banks split up the genus *Hemerobius* into three, giving the following synopsis:—

No outer cross-veinlets in hind wings, only four, or less, in outer gradate series of fore wings; usually but two radial sectors; a cross-veinlet connecting first radial sector to median; the median is usually a little bent toward the cubitus at connecting veinlet; in hind wings the median usually forks plainly beyond forking of radial sector: small species. *Symphorobius*.

Outer cross-veinlets present in hind wings; more than four veinlets in outer gradate series in fore wings; usually three or four radial sectors.

(a) A cross-veinlet connecting first radial sector to median some distance out on the former; often four radial sectors; the median is rarely bent toward the cubitus at connecting veinlet; in hind wings the first radial sector forks as far out as forking of median: larger species. *Boriomyia*.

(b) The cross-veinlet from median to radius is before or at origin of radial sector, never out upon it; three, rarely four, radial sectors; the median is more or less bent toward cubitus at connecting veinlet; in hind wings the median is forked further out than fork of first radial sector. *Hemerobius*.

The author states that this division will apply to the European species thus:—*Hemerobius* (s. str.): *humuli*, *micans*, *atrifrons*, *nitidulus*, *stigma*, *limbatellus*, *lutescens*, *orotypus*. *Boriomyia*: *concinus*, *4-fasciatus*, *subnebulosus*, *nerosus*. *Symphorobius*: *elegans*, *parvulus*, *inconspicuus*.

*H. pini* remains in the restricted genus *Hemerobius*. The species described by McLachlan as *H. mortoni* is to be referred to *Boriomyia*; and if Banks is right in regarding *H. inconspicuus* as a *Symphorobius*, then *H. pellucidus*, Walk., should be placed in the same genus. But it must be kept in view that both *H. inconspicuus* and *H. pellucidus* have regularly three radial sectors, while in all the examples of the former in my collection there is a cross-veinlet between the radius and branch of the radial sector at the apex of the hind wing. In the five examples of *H. pellucidus* before me the same cross-veinlet exists in the left hind wing of one specimen only.

However, the purpose of these notes is not to discuss the genus or genera as a whole, but rather to bring under notice the fact that two species have hitherto been mixed in British collections under the name of *S. elegans*.

In this country these small insects do not appear to have been taken usually in numbers, and until I received from Mr. Martin E. Mosely a male taken by him in Hampshire, I had no British specimens in my collection. Since then I have seen a nice series of twelve specimens taken by Mr. Hugh Scott, of the University Museum of Zoology, Cambridge, to which I shall again allude, and of which he very kindly presented me with three specimens. All these belong to the smaller species.

Of the other species, to which I shall refer as *S. striatellus*, Klapálek, I had seen no British example until recently, when Professor J. W. Carr, of Nottingham, sent me one in fine condition in a large collection of Neuropteroid insects forwarded for determination. I then applied to Mr. Porritt to let me know what he had of supposed *elegans*, and he at once very kindly forwarded all he possessed, not a great deal and nearly all "carded" specimens, but including both forms, and therefore of much interest and use to me in helping to a more satisfactory understanding of the matter.

*S. striatellus* was described by Klapálek from the Transylvanian Alps ('Vest. Ceske Akad. Frant. Jos.,' vol. 13, p. 7, 1905). A specimen in a lot of Neuroptera-Planipennia received from the Zoological Museum, Berlin, for determination called my attention to another female in my own collection from Macugnaga, received from McLachlan along with others of the so-called *S. elegans*.

The following short diagnosis will, with the aid of the wing photographs, serve to separate the two:—

Face dark shining piceous; dorsum of thorax also dark pitchy brown; neururation of fore wings entirely fuscous without pale interruptions, these wings heavily marked to the wing base, the markings more or less radiate, especially those proximal to the middle series of gradate veinlets, those in the distal part

of the wing much broken up into irregular dots; gradate veinlets usually heavily shaded. Larger darker species . . . . . *striatellus*.

Face and dorsum of thorax yellowish; neuration of fore wings with pale dotted interruptions; dark markings on outer half of fore wings mostly placed opposite each other on either side of the dark portions of the longitudinal veins. A pale space at the base of these wings in which the veins are rather indistinct, the transverse veinlets being hardly visible. Paler smaller species . . . . . *elegans*.

Of *S. striatellus*, in addition to the specimen sent by Professor Carr (Nottinghamshire, from ash), I have seen two examples from Blackheath (July 2nd, 1895, November 9th, 1895, Beaumont), and one from Wells, Lincolnshire (August 3rd, 1888, Eardley Mason), all in Porritt's collection.

*S. elegans* is represented in the specimens before me by the example from Hampshire (by the Test, June 12th, 1913, Mosely); two from Blackheath (June 27th, 1896, June 27th, 1901, Beaumont); and one from Lewisham (June 6th, 1873), from Porritt's collection. Mr. Scott's fine series of twelve examples were taken on June 30th last at Henley-on-Thames. They were fluttering round the ends of the branches of some oaks in an isolated clump of trees. The oaks were much blighted and very sticky. The time was about 7.15, and the evening warm and fine. Other specimens were seen at the same trees at just the same time one or two evenings later.

My friend Dr. Ris, to whom I am once more indebted for the beautiful photographs which illustrate this paper, tells me that he has of *S. striatellus*: three females, Katzenssee, July 31st, 1892 (1), and July 3rd, 1893 (2); one female, Rheinau, September, 1907—believed to be all from birch. Of the smaller species: two females, Salgesch, Valais, June 15th, 1889 (the late Moritz Paul); one female, Rheinau, May, 1894.

When McLachlan wrote his "Monograph of the British Neuroptera-Planipennia" (Trans. Ent. Soc., 1868, part 2, p. 176), he may have had both species before him. Both occur in the Blackheath and Lewisham district, which he certainly at a later period knew well, and some points in his description might be considered suggestive of both. Thus with regard to the colour of the front he says "sometimes yellowish testaceous," also "anterior wings closely spotted with darker grey and varying according to the extent to which the spots coalesce." On the other hand, his reference to the whitish dotted interruptions on the longitudinal veins of the disc gives a very definite bias in the direction of the smaller species which I believe has been generally accepted as *S. elegans*. But Stephens's descriptions of *elegans* and *marshami* (for a copy of which I am



indebted to Mr. Herbert Campion) refer to something which has immaculate neururation, and Mr. Campion, who has also very kindly examined Stephens's supposed types in the British Museum, is of opinion that the *elegans* and *marshami* of Stephens are conspecific with *striatellus*. If there has been no confusion about Stephens's types, a change in the nomenclature here used will be inevitable. I leave the matter as it is in the meantime, pending further inquiries. I confess that it is a little puzzling that McLachlan should have failed to notice the immaculate condition of the neururation of *elegans* and *marshami* when he examined them in 1868, and that he should have distinctly stated that there existed in *elegans* an important character at variance with Stephens's diagnosis and with his type of *elegans*. If *S. striatellus* prove to be the true *elegans* of Stephens, Rambur's name *pygmaeus* will require to receive consideration in connection with the smaller species.

The wing figures here given are both from female examples, and, as is usual in these insects, the markings are more pronounced than in the average males. A number of closely allied forms have been described by Father Navás from Spain and elsewhere. Of two of these the author has generously given me examples, *S. conspersus* and *S. venosus*, and although they present a certain amount of difference, especially in the coloration of the body, I am not prepared to say that they are more than varieties of what is here called *S. elegans*. A much more exhaustive examination of all the forms, especially with regard to the structure of the genitalia, is required before a proper valuation of these is possible.

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EXPLANATION OF PLATE V.—1. Wings of *Borismyia subnubulosa* (nat. length of fore wing, 9 mm.). 2. Wings of *Symphærobius striatellus* (nat. length of fore wing, 5 mm.). 3. Wings of *S. elegans* (nat. length of fore wing about 4 mm.).

13, Blackford Road, Edinburgh: May, 1914.

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## THE SLEEPING ATTITUDE OF LYCÆNIDÆ.

By F. W. FROHAWK, M.B.O.U., F.E.S.

It is generally supposed that the Lycænidæ sleep throughout the night, sitting head downwards on the flower-heads and stems of grasses and other plants, in the characteristic attitude they assume during evening and twilight. But later, when darkness supersedes, these butterflies (*L. icarus*) turn round and sleep head upwards. I am indebted to Mr. W. Holland for kindly calling my attention to this interesting fact. In a letter recently received from him, he alludes to marking down groups of *L. icarus* at rest on marram grass in the evening, and states

"they were all head downwards from 4 p.m until darkness. These groups I stayed to watch, and in every case they reversed their position to head upwards at dark. In fact, they hardly waited for it to get quite dark." This habit he has often previously noticed.

I recently turned down some *icarus* on large plants of flowering grasses, upon which they rested each evening in the usual way, head downwards, and remained so until darkness set in, when they turned round and rested head upwards, which position they retained for the night. No doubt other species of "blues" act in a similar way.

It is considered that these butterflies rest for the night head downwards so as to defeat the attacks of birds which would be unlikely to inflict an injury on the vulnerable thorax, and would only grasp the wings if they attempted to seize a resting butterfly, and when darkness has compelled the birds to sleep, the butterfly can safely resume a normal resting attitude.

Possibly this may be so, but such is mere conjecture, and it is most unsatisfactory to theorize on natural phenomena. When butterflies have taken up their resting attitudes, it seems somewhat improbable that they are attacked by birds to any appreciable extent, or very seldom. I cannot remember having seen an instance of such, but have occasionally seen birds pursue butterflies on the wing, but directly the latter settled with closed wings the birds were eluded and gave up the chase.

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## AUSTRALIAN BEES OF THE GENUS *EURYGLOSSA*.

By T. D. A. COCKERELL.

### *Euryglossa calliopsiformis*, Cockerell.

♂. Differs from description of female as follows: clypeus all yellow except a minute spot on each side; supraclypeal mark large, broadly triangular, with a spear-head shaped prolongation from its apex; lateral face-marks pointed at end; yellow band on posterior orbits rather narrow, its upper end diverging from the orbit; antennæ long, scape yellow in front; pleura with additional yellow markings; abdominal bands yellow.

*Hab.* Mackay, Queensland, at flowers of *Leptospermum*, October, 1898 (Turner). British Museum. This male is easily known from that of *E. calliopsella* by the colour of the scutellum.

### *Euryglossa altitudinis*, sp. n.

♂. Length 4 mm.; black, with the clypeus (but no supraclypeal or lateral marks), labrum, mandibles (except red apices), scape in front, and tubercles, all light yellow; flagellum long, light ferruginous beneath; head broad; face with long white hair; front dull; meso-

thorax very feebly shining, rather coarsely microscopically tessellate; tegulae fuscous; wings hyaline, slightly reddish, stigma and nervures rather pale dull reddish; first r. n. entering basal corner of second s. m.; legs yellow, with the anterior femora and tibiae mainly black behind, the middle femora and tibiae also dark behind and their tarsi brown, the hind femora and tibiae black, their tarsi dark reddish (the hind coxae and trochanters are yellow); abdomen rufopiceous, with yellow bands, usually mostly concealed, at bases of segments; venter yellow.

♀. A little larger; no yellow markings on head; tubercles yellow; legs black; yellow bands at bases of abdominal segments 2 to 4, very broad at sides, but interrupted in middle; apical segment more or less reddish.

*Hab.* Mt. Lofty, S. Australia, December 31st, 1912 (R. E. Turner). British Museum. Two of each sex; the type is a male. This may be compared with *E. ridens*, Ckll., but is at once distinguished by the dull mesothorax and the shape of the head. Mr. Meade-Waldo notes: "In *Euryglossa calliopsella-rubiginosa-maculata* group, but distinct."

*Euryglossa hemichlora*, sp. n.

♂. Length 4 mm.; head and thorax dark olive-green, the head dull, the thorax shining; mandibles, labrum, the low and broad clypeus (but no supraclypeal or lateral marks), scape in front, and tubercles, all yellow; hair of head and thorax white, thin and rather long; flagellum very long, light ferruginous beneath; tegulae pallid, reddish; wings hyaline, iridescent, nervures and the large stigma light reddish-brown; second s. m. broader than high, receiving first r. n. a short distance from base; legs yellow, the femora and tibiae dark brown behind, hind femora dark except apex and a stripe above, hind tibiae and middle and hind tarsi reddish-brown; abdomen reddish-brown, paler at apex, and with pale bands at ends of first three segments; venter yellow. The hind trochanters are yellow, and their coxae yellow at apex.

♀. A little larger; no yellow markings on head; clypeus and supraclypeal area piceous, with scattered punctures; labrum and mandibles (except at base) reddish; tubercles yellowish-white; abdomen darker, very broad, without evident pallid bands; venter dark; legs piceous, anterior knees and tibiae in front yellow, middle tibiae with a yellow stripe.

*Hab.* Yallingup, S.-W. Australia, September 14th–October 31st, 1913 (R. E. Turner). One male (= type), four females. British Museum. Allied to *E. altitudinis*, but easily known by the green colour.

*Euryglossa melanosoma*, sp. n.

♀. Length about  $4\frac{1}{2}$  mm.; black, shining, with thin white hair; head broad; flagellum short and thick, variably fulvous beneath, especially pallid apically; front, mesothorax and scutellum shining; tegulae piceous; wings hyaline, nervures and stigma dilute sepia;



recurrent nervures meeting transverso-cubitals; apical plate of abdomen narrow, ferruginous.

*Hab.* Yallingup, S.-W. Australia, September 14th–October 31st, 1913 (R. E. Turner). Two females. British Museum. Resembles *E. inconspicua*, Ckll., but readily distinguished by the black legs and shining metathorax. Readily known from *E. nigra*, Sm., by the normal antennæ and the shining, polished abdomen.

*Euryglossa latissima*, sp. n.

♀. Length about  $4\frac{1}{2}$  mm.; very broad and robust, with thin white hair; head and thorax olive-green, shining, the front dull; head very broad; mandibles cream-colour, with bidentate dark rufous apex; labrum dark; clypeus sparsely punctured; flagellum ferruginous beneath; mesothorax microscopically lineolate; tubercles densely fringed with white hair; legs black or slightly chalybeous basally, but knees, tibiæ and tarsi ferruginous, the middle and hind tibiæ largely dusky; tegulæ pale testaceous; wings hyaline, stigma dark rufous, nervures pallid; second s.m. very large, quadrate, receiving first r.n. near base; second r.n. meeting second t.c.; abdomen shining, very broad, honey-colour, the first segment mainly piceous, the following three with narrow subapical dusky bands and suffused dusky lateral spots.

*Hab.* Eaglehawk Neck, S.-E. Tasmania, February 12th–March 3rd, 1913 (R. E. Turner). British Museum. To be compared with *E. rubiginosa*, D. T., but without the dense fulvous hair of that species.

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GARDEN NOTES.

BY CLAUDE MORLEY, F.Z.S.

WE constantly find in the English periodicals a multiplicity of records from moors, fens, marshes, mountains, and all kinds of wild corners where insects most do congregate, because they are undisturbed by our civilization; but how seldom are published notes from those spots actually inhabited by entomologists and consequently those where most leisure can be enjoyed to note details of history and habits! In treating of a particular spot, such as one's own garden, it is well to set forth the geological formation underlying it, since upon this depends the soil of the district and consequently a large percentage of the vegetation upon which the great majority of its insects subsist. The garden of Monk Soham House is about four acres in extent (including the paddock), and lies almost in the centre of High Suffolk, a somewhat vague district, which may be said to be a ridge of somewhat elevated tableland obliquely crossing the county from north-east to south-west. The surface soil is composed of the Great Chalky Boulder Clay, which at certain points



is fully a hundred feet in depth. It appears to be the *moraine profonde* of an ice-sheet formed in the extreme period of the Glacial Epoch, and consists of grey clay intermixed with fragments of chalk, and is full of boulders of Oolite, Lias, and some other rocks, which are often polished and grooved by ice-action. So rich is the surface that little or no land in the neighbourhood goes untended, woods are rare and very small, and pasture at a minimum. Few more unpromising places could be imagined by the entomologist; and yet this garden, which was held by commendation by a freeman of Ely's abbot in Saxon times, by Robert Malet in 1086, and has undoubtedly been under cultivation ever since, produces things of interest, as I trust the following jottings will show.

1. *Dipteron preying upon Hymenopteron*.—We all know the manner in which Hymenoptera take toll of Diptera; the numerous species stored up as food for their larvæ, as well as the single specimens so often noticed outside the nests of Aculeates, and the large numbers slain entomophagously by the parasitic kinds. But I can recall no record of retribution on the part of the latter, except in the case of the genus *Dioctria*. To-day (June 1st, 1914), I saw a small Empid fly sitting upon a bramble leaf, holding in its fore or its anterior legs a yet smaller insect. These I tubed, expecting to find that the prey was (as is most usual in such cases) one of the smaller species of the Dipterous genus *Sciara*. What, then, was my surprise upon discovering that it was a Chalcid of the difficult—and to me unintelligible—genus *Eulophus*, Geoff.! It was quite dead, though I could not see what part of its anatomy the Empid, which proved on examination to be *Tachydromia minuta*, Mg., had been sucking.

2. "*These Animals Bite*."—My wrist was seized by *Anthocoris sylvestris*, Linn., in no friendly manner, while I was reading in the garden at 9.30 p.m. on July 7th. His proboscis was firmly inserted through the skin and effected a small, sharp pain like the prick of a No. 19 entomological pin. He sucked my blood at his own sweet will for two minutes, possibly three, thereafter I saw his face no more. The result was disappointing; none of the throb induced by *Cimex* was experienced; the small pricking lasted for fifteen minutes and then ceased; a slight blush at the point of insertion had faded in five, and nothing further was seen or felt. I have very rarely been the victim of Heteropterous onslaughts, and can recall no specific occasion since *Capsus lanarius*, Linn., was captured flying on July 21st, 1896, when it promptly turned upon me and caused my thumb "sensations similar to those set up by *Urtica dioica*," to quote my diary of that date.

3. *A Curious Aerial Dance*.—Records of unspecified insects are often useless, but the aerial dances of *Hilara* species form a

wide subject and the (doubtless specific) evolutions appear to have received little attention. It may be of interest, therefore, to note that on the morning of June 26th, at 8.30 a.m., members of this genus were forming a somewhat dense horizontal column near the west bank of the moat, and four feet to the east, on the edge of the sunshine, was a similar column; each column was about two and a half feet high, and between them individual specimens perpetually darted backwards and forwards at great speed, apparently mingling for a few moments with each column in turn, and straying away nowhere else. How long the dance lasted I failed to note, but similar evolutions were in progress at the same spot upon the two following days, when the movement seemed to vary in no way.

4. *Liophloeus nubilus*, Fab.—This appears to be a distinctly uncommon species of weevil in my twenty years' experience in Britain, occurring only in May (when I took it at Dover during 1896) and the first few days of June. In Suffolk it is both rare and local; and, although Garneys found three at Beddingfield about 1870, Tomlin noticed it at Glemsford in June of 1905, and Dr. Sharp tells me it occurs freely at Mildenhall, I have never taken it outside my garden. Here it may be annually seen sparingly, and on May 15th last we were much diverted by watching a perfect beetle consuming a leaf of ivy with its nasal mandibles. It held the outer edge of the leaf, like a lepidopterous larva does, and, like it, excised the leaf in a semicircular manner, beginning at the furthest point its rostrum could reach and gradually biting the edge towards its sternum, thence repeating the process from the furthest point. Here it is most usually found among the garden weed locally known as "ground elder," though never far from ivy.

5. *A Non-carnivorous Empid Fly*.—I have never noticed members of the Empidæ prey upon aught but perfect insects till May 5th, when a female *Tachydromia pallidiventris*, Mg., was seen on the disc of a large bramble-leaf, assiduously sucking the surface with its proboscis. The leaf was examined with a lens and found to be sparingly covered with minute excreta, which was not honey-dew, for no Aphids were present, but which had probably been emitted by either *Apion vorax*, Herbst., *Batophila rubi*, Payk., or an *Anthocoris* larva, all of which were sitting immediately above the leaf in question. I was careful to note that the Empid carried no prey; it is a common species throughout Suffolk, where I have studied its curious mode of copulation on the coast, Norfolk, Lincoln, and Wiltshire; Mr. Bedwell once bred it from a small (? Braconid) cocoon.

6. *Probable Host of Lissonota femorata*, Hlmgr.—Nothing has hitherto been ascertained respecting the economy of this Pimplid Ichneumon, and it may consequently be worthy of note that upon June 29th I saw a female walking over and investi-

gating a dead willow-trunk in my garden. This particular trunk has been under my observation for ten years, and no Lepidoptera (the usual hosts of the genus *Lissonota*) are known to breed in it. Nothing nests there, as far as I am aware, but Aculeates and, perhaps, *Dictenidia bimaculata*, Linn.; but the smaller Fossores—species of *Passalæcus*, *Trypoxylon*, and *Pemphredon*—are abundant; though the only thing of sufficient size to render it a probable host for this Ichneumonid is the bee *Osmia leaiana*, Kirby, of which numerous specimens were seen about the same time. The elongate ovipositor renders its parasitism upon some burrowing insect nearly certain.

7. *A Pugnacious Dolichopodid*.—*Pæcilobothrus nobilitatus*, Linn., is common about the moat, and on June 28th I watched one individual for about an hour. This was undisputed lord of a group of three overlapping water-lily leaves (*Nymphæa alba*), about which it briskly walked and occasionally sucked their surface as though for nutriment. At irregular intervals it would make short flights to neighbouring leaves, but these appeared purposeless, and it always returned to its particular three, from which it drove away by flying point blank at them all other Diptera—mainly Notiphilæ and Dolichopodids—while the presence of *Gerris gibbifera*, Sch., larvæ was ignored. The only foes it feared were *Pyrrhosoma nymphula*, Sulz., and *Agrion puella*, Linn.; from these it fled precipitately. At rest it would somewhat slowly and at long intervals vibrate its wings, much in the manner of *Scoptera vibrans*, Linn.

(To be continued.)

## ACRONYCTA (HYBOMA) STRIGOSA IN WICKEN FEN.

By T. A. CHAPMAN, M.D., F.E.S.

IN the matter of Wicken Fen, Mr. Rowland-Brown's article in the 'Entomologist' for July, 1914 (p. 185), suggests to me to say a word for the protection of an old pet of mine, *Acronycta* (*Hyboma*) *strigosa*, if it still exists. Most probably it does; though I understand that of late years it is rare or absent. The expression in Mr. Rowland-Brown's observations that induces me to advance my plea is that in which he condemns, amongst other things, "low shrubby trees."\* Many years ago I reared *A. strigosa* from the egg for several broods, and I carefully examined its habitat in the Wicken district, though I did not capture any specimens. It is long since I was at Wicken, and do not know what changes have occurred there since; nor

\* I suggest, of course, that these be cut, if at all, only where necessary, and with the greatest discretion; I hope other entomologists will assist with their views.—[H. R.-B.]



do I recollect or know how far the habitat of *A. strigosa* was or is included in the now preserved portion of the Fen. *A. strigosa* feeds on hawthorn, and why it should be so localised is not very obvious. Various reasons may be suggested, climatic and others. There is one somewhat important one, as to which I feel tolerably certain. *A. strigosa* pupates in a cocoon which it forms by burrowing into rotten wood, and consequently it cannot thrive unless the trees on which it lives are old and possess some dead portions that have some fairly rotten wood. No doubt larvæ on other hawthorn trees will find places in which to pupate, but such places will be unsuitable, and will result in the greater number of individuals who do so perishing in the winter. Not impossibly stumps of cut reeds may afford as good substitutes as any.

The point, however, on which I desire for the moment to insist, is that old hawthorn trees should be jealously guarded, and that sufficient younger trees should be spared in order that in due time they may replace the older ones as these perish, and that none of the old ones and not all the younger shall be included in the sweeping condemnation of "low shrubby trees."

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## NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

### *Trachea conjuncta*, sp. n.

♂. Head and thorax whitish, the latter marked with dark brown on edges of collar and patagia; antennæ bipectinate except at tip. Fore wings whitish, tinged and clouded with ochreous brown; subbasal line black, double, wavy, not clearly defined; antemedial line black, double, sinuous; postmedial line black, double, strongly curved from costa to middle, thence sinuous to dorsum; a broad oblique blackish band from costa to about middle of a black bar connecting antemedial and postmedial lines, and a narrow oblique blackish band from the connecting bar to dorsum; orbicular and reniform stigmata whitish, finely outlined in black and enclosing brownish marks; a blackish quadrate mark (extending to costa) between the stigmata; three blackish marks on terminal third of the wing—one at costal end of postmedial line, one (the largest) below middle of postmedial, one below apex; fringes chequered with black. Hind wings white with blackish discoidal dot and two dusky transverse lines beyond; fringes grey brown. Under side whitish; fore wings suffused with dusky except on margins, the blackish postmedial line is preceded by a blackish cloud on costal area; hind wings have a black discoidal lunule and blackish transverse line as above.

Expanse, 34 millim.

Collection number, 1751.

A male specimen from Rantaizan, May 9th, 1909.



*Kerala lentiginosa*, sp. n.

♀. Head and thorax pale brown, the latter marked with black; abdomen brown, slightly darker than the thorax. Fore wings pale brown, thickly freckled with darker brown except on middle of dorsal area; subbasal and antemedial lines blackish, originating in black spots on the costa, the first line indented above dorsum, the second line diffuse and angled below middle; reniform stigma represented by a black lunule; postmedial line dark brown, double, indented above dorsum; subterminal line blackish, wavy and interrupted, most distinct and black from below apex to middle; fringes pale brown marked with darker. Hind wings whitish, bordered with blackish on terminal area; fringes whitish. Under side whitish, fore wings suffused with blackish on the disc; a blackish subterminal line on all the wings.

Expanse, 32 millim.

Collection number, 934a.

One female specimen from Arizan (7350 ft.), August 22nd, 1908.

Comes nearest to *K. decipiens*, Butler.

*Kerala lentiginosa suffusa*, ab. n.

♀. Fore wings suffused with dark brown except at base and on the middle of dorsum; hind wings slightly tinged with brown, blackish border less distinct.

Expanse, 30 millim.

Collection number, 934.

One female specimen from Arizan (7500 ft.), September 16th, 1906.

*Macrobarasa albibasis*, sp. n.

♂. Head whitish grey; thorax somewhat darker grey, collar edged with blackish; abdomen brownish grey, whitish at base and anal extremity. Fore wings whitish grey suffused with brownish except on basal fourth; subbasal and antemedial lines black, sinuous, angled below costa; postmedial line black, angled below costa, slightly wavy to vein 3 where it is deflected inwards for a short distance, thence sinuous to dorsum; other irregular transverse lines between antemedial and postmedial; orbicular and reniform stigmata white, finely outlined in black; subterminal line black, wavy, edged with white on costa; fringes white mixed with brownish at the base, preceded by a black line. Hind wings whitish, veins and hairs thereon brownish; terminal area broadly bordered with blackish; fringes whitish mixed with brownish at the base. Under side whitish, all the wings have dusky discoidal marks and postmedial lines, and are broadly bordered with fuscous.

Expanse, 36 millim.

Collection number, 1752.

A male specimen from Rantaizan, May 12th, 1909.

Allied to *M. xantholopha*, Hampson.

*Batracharta divisa*, sp. n.

Head and thorax dark brown, the latter powdered with grey and cross-barred with lighter brown and black; abdomen brown above, paler below. Fore wings brown, clouded and mottled with darker, the basal portion of the wing limited by the postmedial line is suffused with greyish; postmedial line black, curved round cell with an obtuse angle opposite end of cell, slightly oblique from median nervure to just above dorsum where it turns inwards, terminating on dorsum at about one-fifth from base of the wing; a blackish irregular patch near the costa is outwardly margined by the postmedial line; subterminal line black, slightly wavy, almost parallel with the termen; fringes brown traversed by a darker line. Hind wings fuscous inclining to whitish on costal area; discoidal mark blackish, diffuse; fringes pale brown. Under side whitish buff, the fore wings suffused with blackish on discal area; all the wings have a black discoidal mark, that on the hind wings large and conspicuous.

Expanse, 46 millim.

Collection number, 1508a.

A male specimen from Kanshirei, November 17th, 1908.

This species comes nearest to *B. cossoides*, Walk.

*Fodina contigua*, sp. n.

Head and thorax black, a line between antennæ, edges of collar, patagia and the metathorax, pale ochreous; abdomen ochreous. Fore wings black, the costal area from near base to beyond middle, also a small patch at tornus, flecked with pale ochreous; subbasal line pale ochreous, not extending to dorsum; from outer end of flecked costal area a pale ochreous band tapers to the tornal patch; fringes dark grey, black at the base, preceded by a pale ochreous line. Hind wings ochreous broadly bordered with black, the border tapered towards tornal area, which is heavily flecked with black; fringes ochreous mixed with black. Under side ochreous; fore wings clouded with black; hind wings with dusky borders.

Expanse, ♂, 40 millim.; ♀, 44 millim.

Collection number, 1506.

One example of each sex from Kanshirei obtained in 1908; the male on April 22nd, and the female on June 6th.

The sexes are alike in colour and pattern, but as the female is in better condition than the male, it has been described. The species comes very near *F. postimaculata*, Hampson, from which it differs chiefly in colour.

*Fodina contigua fusca*, ab. n.

All the typical markings of the fore wings are obscured by fuscous suffusion; the hind wings and under side of all wings entirely fuscous.

Expanse, 44 millim.

Collection number, 1515.

A male example from Kanshirei, April 8th, 1908.

*Harmatelia basalis obscura*, ab. n.

♀. Differs from typical *basalis* (Moore) in the absence of white postmedial line and in the terminal area of fore wings being very little paler than the basal two-thirds.

Expanse, 50 millim.

Collection number, 1516.

A female specimen from Kanshirei, April 28th, 1908.

*Ædia obscura*, sp. n.

♀. Head and thorax brown, sparsely mixed with grey; abdomen paler. Fore wings brown, paler and sprinkled with grey on apical and terminal areas; antemedial line darker brown, double, sinuous, enclosed space paler than the ground colour; postmedial line darker brown outwardly edged with paler, excurved from costa to vein 4, inwardly oblique from vein 4 to dorsum, indented below vein 6; reniform stigma outlined in dark brown but not clearly defined; subterminal line dark brown, sinuous, indistinct; fringes brown, a dotted ochreous line at base. Hind wings white, broadly bordered with brown; fringes white at tornus. Under side of fore wings fuscous, and of hind wings white with broad fuscous border; all the wings have a dusky discoidal mark, that on the fore wings is lunular and that on the hind wings colon-like.

Expanse, 34 millim.

Collection number, 175.

A female specimen from Takow, September 1st, 1904.

Allied to *Æ. mosara*, Swinhoe.

*Adrapsa quadrilinealis*, sp. n.

Head, thorax, and abdomen brown, some whitish hairs in anal tuft; antennæ pectinate on one side. Fore wings brown, powdered with darker; antemedial and postmedial lines dark brown, the first sinuous, the second wavy, excurved and edged with whitish on costal area; medial line dark brown, diffuse, almost straight from white discoidal lunule to dorsum; subterminal line white towards costa, where it edges a whitish subapical patch, obscured towards dorsum, inwardly clouded with dark brown; fringes marked with whitish towards apex and preceded by black-edged whitish lunules. Hind wings slightly paler becoming whitish above tornus; transverse lines similar to those on fore wings, except that the medial line is absent. Under side whitish brown sprinkled with darker; markings as above but the transverse lines of fore wings are not distinct.

Expanse, ♂, 42 millim.; ♀, 40 millim.

Collection number, 1004.

One example of each sex from Kanshirei; the male obtained April 22nd, 1908, and the female, April 19th, 1906.

*Mecodina* (?) *albipuncta*, sp. n.

♂. Head fuscous brown mixed with paler; palpi fuscous brown, paler at the base and the tip of third joint; thorax and abdomen fuscous brown mixed with paler; antennæ finely ciliated. Fore

wings pale brown almost whitish-brown on the disc, sprinkled and clouded with fuscous brown; two white spots in the cell, the outer lunular and smaller than the inner; antemedial line blackish, wavy, angled below costa; medial line blackish, sinuous, commencing in a blackish triangular mark on the costa; postmedial line blackish, wavy, curved round cell, united with outer edge of triangular mark on costa; subterminal line blackish, wavy; terminal area fuscous brown traversed by a diffuse and sinuous band of the ground colour, short black bars between the veins joining black lunules on the termen; fringes fuscous brown marked with paler between the veins. Hind wings fuscous grey with two dusky transverse lines, the outer one sinuous and most distinct; subterminal line whitish outwardly dentate, inwardly diffuse, not distinct towards costa; fringes pale brown marked with darker between the veins, preceded by a series of black lunules. Under side pale brown; markings of fore wings as on upper side but the terminal area is not darker and the short black bars are not distinct except between veins 3 and 5; the transverse lines on hind wings are dark brown, the first bluntly angled beyond the black discoidal mark, the second is serrated and is followed by a brown band which is clouded with blackish about the middle and before dorsum.

Expanse, 35 millim.

Collection number, 929.

A male specimen from Kanshirei, June 16th, 1908.

*Mecodina (?) subornata*, sp. n.

♂. Head and thorax fuscous brown, the latter mixed with darker in front; abdomen whitish brown, heavily powdered with fuscous brown except on the anal tuft. Fore wings fuscous brown, traces of two whitish dots in the cell; antemedial line blackish, indistinct except on costa where it is inwardly edged with white; postmedial line blackish, sinuous and wavy, outwardly pale edged, the edge becoming white and diffuse on the costa; medial line blackish, almost parallel with the postmedial from cell to dorsum; fringes fuscous brown, variegated with white toward apex and tornus. Hind wings fuscous brown, traces of a pale transverse line above tornus. Under side pale brown, variegated with darker brown; on the fore wings the costa is paler, and the terminal area from tornus to a black spot at middle whitish; on the hind wings, the basal and terminal thirds are whitish; all the wings have dark transverse lines.

Expanse 38 millim.

Collection number, 929a.

A male specimen from Kanshirei, April 18th, 1906.

## NOTES AND OBSERVATIONS.

*PLUSIA MONETA* IN NOTTINGHAMSHIRE.—I have great pleasure in reporting the capture in my garden of *Plusia moneta*; it was taken by my son, W. J. Daws, on the evening of July 4th, 1914, and is now in my collection. It is a fine female, but by the appearance of the



body it had already deposited its ova; three or four years ago I planted a few plants of monkshood, but this is the first time we captured *P. moneta*. The plants have been searched each season, but without result until this year. On Wednesday, July 8th, we made another search, and found one half-grown larva and one fresh cocoon. Would you kindly tell me if there are any previous records of *P. moneta* in Nottinghamshire, or is this the first for the county?—WILLIAM DAWS; 39, Wood Street, Mansfield, Notts, July 9th, 1914.

[*P. moneta* has been noted from most of the counties of England up to Cheshire, but I do not recall any previous record of this species from Nottinghamshire.—R. S.]

ACHERONTIA ATROPOS IN KENT.—Mr. Percy Richards (*antea*, p. 205) recorded a specimen of *A. atropos* captured at Hythe on June 15th last. In a communication dated July 8th he writes:—"Another specimen was found at rest on a mulberry tree in Hythe. It is a fine female, measuring 5 in. in expanse. I have no doubt, judging from its condition, that it had only just emerged from pupa, although the nearest potato patch is two hundred yards from the mulberry tree."

PAPILIO HOSPITON IN CORSICA.—Mr. Gurney states on p. 176 of the 'Entomologist' that a French entomologist, resident at Ajaccio, informed him that the food-plant of this species did not grow in the Vizzavona district, and that examples taken there were chance ones. This statement is an error, the food-plant of *P. hospiton* does grow at Vizzavona, and the larvæ are locally common on it there. Towards the end of July, 1906, I found twenty-seven larvæ in two days, as recorded in the 'Entomologist,' xl. p. 77.—W. G. SHELDON.

NOTE ON AMMOPHILA CAMPESTRIS?—On the intensely hot afternoon of July 11th I was watching a sandy hillside, on West Knighton Heath, for Aculeates. My attention was directed to an insect (almost certainly *Ammophila campestris*, which is even commoner than *A. sabulosa* here, but exact determination seemed of less importance than leaving the creature undisturbed) which was carrying in its mandibles a small, round white pebble. This it carefully deposited, with others, at the mouth of its burrow. It then rapidly fussed about until it had found another quite similar stone, being very eclectic, and so intent on its task that I could bend closely over it. After seeing several additions to the little heap, which at last obscured the opening, I gently withdrew. Are these last touches of maternal care protective against some parasite? Is the habit general?—F. H. HAINES, D.P.H., &c.; Winfrith, Dorset, July 12th, 1914.

DEILEPHILA (HYLES) EUPHORBIE IN CORNWALL.—While staying at St. Gennys, North Cornwall, during August, 1910, I caught a large moth, which remained unidentified in my collection until last Friday, when a friend told me that, in his opinion, it was a Spurge Hawk (*Deilephila (Hyles) euphorbie*). I took it up to the South Kensington Museum yesterday, and they told me that my friend's surmise was correct. I have a fair collection of butterflies, but know

little about moths, which accounts for the Spurge Hawk remaining unnoticed so long.—A. S. BUCKHURST; 9, Souldern Road, West Kensington, July 19th, 1914.

NOTE ON ORGYIA ANTIQUA.—I had larvæ of *Orgyia antiqua* this year in a breeding-cage indoors, feeding them on plum leaves. To my surprise, after the females resulting from the normal brood had laid eggs, these latter began to hatch out about July 11th. I can find no reference to this fact in the text-books. I should be much interested to know whether a second brood has occurred many times before.—A. H. LEES; University of Bristol, July 16th, 1914.

[Larvæ of *Orgyia antiqua* have been observed in August and September, and occasionally imagines have been seen in October.—R. S.]

HYMENOPTERA SUBMITTED FOR DETERMINATION.—We have received from Mr. F. Dennis, of East Liss, in Hants, a handsome female of the largest British Ichneumon fly (*Rhyssa persuasoria*, Linn.), captured upon a window there; a ligneous gall, also found there on oak, is too broken and shrivelled to determine. Mr. Geoffrey Todd, of Barnet, has sent us a bundle of Braconid cocoons from which he has bred *Apanteles ruficrus*, Hal.; these were first observed in larvæ of *Arenostola* (*Leucania*) *brevilinea*, Fenn., on June 24th, and emerged on July 10th. Goureau has given an interesting account of the earlier stages of this parasite at Soc. Ent. France, 2<sup>e</sup> série, tom. iii. p. 355; it has already been bred from *Leucania littoralis*, Curt., and *L. pallens*, L. Neither Mr. Todd nor we can recall previous records of hymenopterous parasites upon this Noctuid moth.—CLAUDE MORLEY; July 22nd, 1914.

ABUNDANCE OF PLUTELLA MACULIPENNIS (CRUCIFERARUM).—I can testify from personal experience as to the abundance of this species. During Easter it was beginning to emerge on the heaths about Sidmouth (South Devon), and was swarming in this locality by April 20th. At Whitsuntide in the neighbourhood of Chelmsford it was abundant on the wing, in the late afternoon, over every roadside patch of waste vegetation.—R. MELDOLA; 6, Brunswick Square, W.C., July 3rd, 1914.

PLUTELLA MACULIPENNIS (CRUCIFERARUM) IN NORTH CUMBERLAND.—This species is now very abundant in this district. I first noticed the moth in June; now, scarcely a field of turnips has escaped. Injury has been principally done amongst the swede turnips, and many of the fields have assumed a grey appearance. The farmers in the district say that such a plague has not been experienced for thirty years.—GEORGE B. ROUTLEDGE; Tarn Lodge, Headsnool, Carlisle, July 7th, 1914.

APPEARANCE OF EUCHLOË CARDAMINES.—May I add my experience of this species during the present season? I first met with it in a clearing in a wood in Kent on April 23rd, at a height of about 200 ft.; it was quite common, and females predominated. Next I found it, in an interval of sunshine, between a couple of thunderstorms, at the Villa Adriana, near Rome, probably at about a similar

elevation, on May 6th; and afterwards at Messina, Sicily (2000 ft.), May 9th; Palermo (2000 ft.), May 12th; and Mount Etna (over 3000 ft.), May 16th. During my trip into Calabria I captured specimens at Palmi (1500 ft.), May 22nd; Catanzaro (2500 ft.), May 24th; Nicotera, May 30th (1000 ft.); and Cape Spartivento (50 ft.), June 3rd. It was flying at Messina (50 ft.) on June 10th, and above and below Bérisal, Switzerland (4500 ft. to 5500 ft.), from June 17th to 22nd, and finally I left the species in excellent condition, both males and females, at Kandersteg, at an elevation of 4000 ft., on Monday, June 29th.—J. PLATT BARRETT; Westcroft, South Road, Forest Hill, S.E., July 3rd, 1914.

A DAY IN DELAMERE FOREST.—On July 11th, in Delamere Forest, and feeding on bramble blossoms, I saw a fine and fresh male *Pyrameis (Vanessa) atalanta*. Was this puzzling butterfly locally bred? did it pass the winter in the egg, larva, chrysalis, or imago state, and where did it hibernate? Or, after it had crossed the waves of the North Sea, or the waters thereto, why did it fly from the east to the very west of the country, arriving in speckless condition? With these unsolved "problems" as companions I subsequently captured a fine *Cenonympha tiphon* with lanceolated spots (subvariety *lanceolata*), and two specimens of *Acidalia straminata* var. *circellata*. This latter insect appears to be common but local here. Possibly it escapes detection when on the wing through being taken for *Crambus margaritellus* or females of *Fidonia atomaria*. At rest, however, on the heather, &c., it cannot well be mistaken. From a female taken on the same spot in July of last year I obtained a large number of eggs. These hatched, and the larvæ went on so well that I had reason to think they would survive the winter. They fed readily on knot-grass (which I think does not grow on or near their habitat), and they began hibernation on the stems, fastening themselves by their anal claspers, and branching out at an acute angle in the form of a note of interrogation. So they remained, until I discovered at the end of last March that many had dropped from their perch. All were dead. I had succeeded in giving them food, and plenty of fresh air, but I had failed in providing the damp environment of the mosses. One of the *C. tiphon* (I only saw five or six altogether) was nearly captured by one of the larger dragonflies (*Æschna juncea*), of which there were many about. A movement on my part scared away the dragonfly, which was only an inch or two behind the butterfly, and so the *tiphon* was saved. The mosses were unusually dry and enabled me to watch the richly-coloured males of *Leucorrhinia dubia*, in black and maroon, hovering over the pools. The females, in which the maroon colour is replaced by yellow, were not so numerous. I found the *tiphon* ground—the only Delamere haunt now, I fear, for the butterfly—guarded by two rows of high iron railings smeared with fresh tar. I thought with regret of the newspaper I had left behind in the railway carriage. Still, the obstruction did not prevent an old veteran of seventy summers clearing the rails and landing safely on the other side, untarred, excepting the hands, which were soon corrected in the dry sand of the place.—J. ARKLE; Chester.



**MOTHS CAPTURED BY LIGHT-TRAP.**—My friend, Mr. F. Gillett, who has a house on the North Downs, near Chevening (Kent), has sent me a list of the Moths that have been attracted by a large trap of his own design during the months of March, April, and May. I think his captures in this manner may prove of interest to readers of the 'Entomologist.' He writes:—

The following is the result of a moth-trap, made like a cupboard with three glasses herring-bone fashion in front, which exactly fits into the window; inside are three 30 c.-p. electric lamps, the door at the back being fitted inside with a looking-glass, and the side with a small window covered by a shutter. The trap is on castors, to be easily movable. It is run from 10 p.m. to 3 a.m., when the light is automatically shut off by an alarum clock downstairs. In February and March it was only run for a few nights, with the result: one Chestnut (*vaccinii*) in February, and one Small Quaker (*cruda*) in March.

**APRIL.**—*Tæniocampa gothica*. 2nd (four); 13th (three); 14th (two); 18th (eight); 19th (two); 20th (eight); 21st (one); 23rd (three); 24th (five); 26th (two); 27th (six); 28th (two); 29th (six); 30th (six)=56.—*T. instabilis*. 3rd (one); 13th (two); 18th (one); 19th (two); 20th (one)=7.—*T. opima*. 21st (one); 26th (one); 27th (one); 29th (three)=6.—*T. gracilis*. 13th (one); 19th (one); 29th (two)=4.—*T. cruda*. 13th (two).—*T. stabilis*. 21st (one); 24th (two); 28th (one)=4.—*Anticlea badiata*. 13th (one); 18th (one); 20th (one); 29th (one)=4.—*A. nigrofasciaria*. 26th (one); 28th (one); 29th (one)=3.—*D. mendica*. 28th (one); 29th (one)=2.—*Hemerophila abruptaria*. 29th (one).—*Xanthorhoë fluctuata*. 29th (one).

**MAY.**—*Tæniocampa gothica*. 1st (two); 2nd (two); 4th (one); 12th (one); 14th (three); 15th (three); 18th (one); 21st (one); 22nd (one); 23rd (one); 30th (three)=19.—*T. gracilis*. 2nd (one).—*T. stabilis*. 16th (two); 20th (two)=4.—*Spilosoma menthastri*. 14th (two); 18th (two); 19th (two); 20th (eight); 21st (one); 22nd (seven); 23rd (two); 28th (three); 29th (four); 30th (ten); 31st (four)=45.—*Diaphora mendica*. 14th (one); 18th (one); 21st (one)=3.—*Tephrosia crepuscularia*. 14th (one); 22nd (one)=2.—*Coremia ferrugata*. 14th (one); 20th (four); 27th (one); 30th (one)=7.—*G. bidentata*. 14th (one); 17th (one); 20th (one); 22nd (one)=4.—*O. luteolata*. 14th (one); 20th (one); 29th (one); 30th (one)=4.—*Agrotis cinerea*. 15th (one); 17th (two); 18th (seven); 19th (one); 20th (eight); 21st (three); 22nd (one); 23rd (sixteen); 24th (three); 26th (one); 27th (five); 28th (eight); 29th (seven); 30th (thirty-one)=94.—*Dianthæcia cucubali*. 16th (one); 20th (one); 21st (one); 22nd (one); 28th (one)=5.—*X. fluctuata*. 16th (one); 19th (one); 20th (two)=4.—*Apamea basilinea*. 16th (one); 23rd (one); 28th (one); 29th (two); 30th (six)=11.—*P. dictæa*. 17th (one).—*Hipocrita jacobææ*. 18th (three); 20th (six); 21st (four); 22nd (three); 23rd (one); 28th (eight); 29th (seven); 30th (seven)=39.—*Hemerophila abruptaria*. 18th (one); 20th (one)=2.—*Mamestra dentina*. 18th (one); 20th (two); 22nd (three); 23rd (one); 27th (three); 29th (four); 30th (three); 31st (one)=18.—*M. thalassina*. 17th (one); 18th (one); 29th (three); 30th (one)=6.—*M. genisteæ*. 19th (one); 21st (two); 22nd (one); 24th (one); 28th (one); 29th



(three); 30th (seven)=16.—*Eupithecia oblongata*. 19th (two); 20th (one); 27th (one); 30th (one)=5.—*Lophopteryx camelina*. 20th (one).—*Mesoleuca ocellata*. 20th (one); 22nd (one)=2.—*Dianthæcia capsicola*. 20th (one); 21st (one)=2.—*D. carpophaga*. 20th (one); 21st (one)=2.—*Eupithecia pygmæata*. 20th (one).—*Dicranura vinula*. 21st (one).—*Grammeia trilinea*. 21st (two); 22nd (four); 23rd (one); 28th (one); 29th (two); 30th (fourteen)=24.—*Anaitis plagiata*. 21st (one); 28th (one)=2.—*Rusina tenebrosa*. 21st (one); 29th (one)=2.—*Lampropteryx suffumata*. 22nd (one).—*Cilix spinula*. 22nd (one).—*Lozogamma petrarica*. 22nd (one).—*Hepialus lupulina*. 22nd (one); 28th (one)=2.—*Eupithecia pulchellata*. 22nd (one).—*Leucania comma*. 22nd (one); 28th (three); 29th (two); 30th (one); 31st (one)=8.—*Agrotis puta*. 23rd (one); 29th (one)=2.—*Plusia gamma*. 26th (one); 27th (four); 28th (four); 29th (six); 30th (six); 31st (one)=22.—*Agrotis exclamationis*. 28th (one); 30th (five); 31st (one)=7.—*Phalena bucephala*. 30th (one).—*Xanthorhoe montanata*. 29th (one); 30th (one)=2.—*Ligdia marginata*. 30th (one).—*Cucullia umbratica*. 30th (one).—*Mamestra pisi*. 30th (one).—R. M. PRIDEAUX; Brasted Chart, Kent, June 16th, 1914.

## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 11th*.—Mr. B. H. Smith, B.Sc., F.E.S., President, in the chair.—Mr. Dunster exhibited a short series of blue females of *Polyommatus icarus* from Horsley.—Mr. Edwards, butterflies from Costa Rica, New Granada, and Borneo.—Mr. W. West, the various species of Coleoptera taken by himself in the New Forest in mid-May, mainly from hawthorn blossom.—Mr. Curwen, about a dozen species with various forms of *Anthroceridæ* (*Zyganidæ*) taken by him in numerous holidays on the Continent.—Mr. Turner communicated a note on the species of mite (*Acarus*) *Tetranychus lintearius* which had recently been exhibited as causing devastation among gorse-bushes.

*June 25th*.—Mr. E. Step, F.L.S., in the chair.—Messrs. Blair and Main, a number of interesting items collected by them during a recent holiday around Meiringen and Lugano, including (1) living larvæ of a *Crioceris* sp. on Bryony (*Tamus communis*); (2) a *Polistes gallica* (living) on its nest; (3) living fireflies (*Luciola italica*) which were "flashing"; (4) a field cricket found by Mr. Ashdown; (5) a series of *Cetonia stictica*; (6) specimens of *Gnophos glaucinaria* with ova, &c.—Mr. Coulson, a long series of many degrees of blue coloration of the females of *Polyommatus icarus* from Horsley and several *Cænonympha pamphilus*, one having a bipupillate apical spot, and another with three well-developed eye-spots on the hind wings above.

*July 9th*.—Mr. A. E. Gibbs, F.L.S., F.Z.S., Vice-president, in the chair.—Mr. Newman exhibited living larvæ of *Gastropacha ilicifolia* and *Celerio gallii*, with the parent imagines of the former species, together with a curiously suffused and obscure form of *Dianthæcia*

*capsincola*.—Mr. Newman demonstrated a method of killing Anthrocerids (Zygænidæ) by immersion in petrol for a few moments, which appeared to be quite successful.—Mr. H. Moore, a living specimen of *Ægrotera phymateus*, a large Orthopteron from the Cape.—Mr. J. Platt Barrett, living male crickets, *Gryllotalpa vulgaris*, small larvæ and ova shells of *Melanargia pherusa*, a large centipede, &c., all from Sicily.—Mr. W. West (Ashtead), the *Phylloxera* of the oak, *P. punctata*.—Mr. Step, several Hemipterous pests, including *Phyllaphis fagi* in masses under leaves of beech, and *Phyllopsis fraxini* in a similar manner under leaves of ash, with *P. fraxinicola* and *Pediopsis tiliæ*.—Mr. R. Adkin, a bred series of *Celastrina* (*Cyaniris*) *argiolus*, from 1913 autumn larvæ on ivy, one or two of which were of the facies of the autumn emergence.—Mr. Hy. J. Turner, the whole of the plates of Rösels *Insekten belustigung*, 1746 (1)–1761, with Kleemann's additional volumes of plates, and an autograph letter *re* the volume from W. Spence, 1812.—Mr. A. E. Gibbs, a drawer of species and forms of *Parnassius*, including *P. mnemosyne*, *P. apollo*, *P. stubbendorfii*, *P. delphius*, *P. apollonius*, *P. imperator*, *P. hardwickii*, *P. discobolus*, *P. romanovi*, &c.—Mr. Step read a Report of the Congress of the S. E. Union of Scientific Societies, held at Bournemouth, June 10th–13th, and which he and Mr. Hy. J. Turner attended as the Society's delegates.—HY. J. TURNER, *Hon. Rep. Sec.*

## RECENT LITERATURE.

*Studies on the Mecoptera of Japan.* By T. MIYAKE (Journal of the College of Agriculture, Imperial University of Tokyo, vol. iv, No. 6, pp. 265–400). Tokyo: December, 1913.

No Neuropterist can well afford to miss this paper, in which Mr. Miyake gives a full and interesting account of his studies in connection with the Scorpion flies and allied insects to be found in Japan. Though he gives them ordinate rank, as do some other entomologists, it is probably more usual to consider them as a subdivision of the Neuroptera. All are placed in one family, Panorpidæ, which is divided into four genera:—*Panorpa* (including *Aulops*) with twenty-seven species, *Panorpodes* with four, *Leptopanorpa* with two, and *Bittacus* with six. Thus there are thirty-nine (or forty with the doubtful *Panorpa hageni*) species in all, as compared with four to be found in Britain and but twenty in either Europe or America. One species only, *Panorpa communis*, Japan shares with us. We have no example of the peculiar *Tipula*-like genus *Bittacus*, of which Japan has six but, on the other hand, Japan does not possess a *Boreus*, one species of which peculiar genus of tiny insects is found with us.

Distinctive wing-markings, prolongation of the mouth-parts into a beak, and scorpion-like extremity of the male abdomen make, *Panorpa*, *Panorpodes*, and *Leptopanorpa* very distinctive insects, while the beak and *Tipula*-like build differentiate the genus *Bittacus*. That the "beak" is a recent acquisition seems clear, for the head of the larva of *Panorpa* is of quite normal form. The beak reaches its

highest development in imagines of that genus. Morphology and anatomy are closely studied, while wing venuration and markings are discussed in even greater detail. Miyake concludes that the Japanese Panorpids may, generally speaking, be grouped in two categories as regards wing-marking:—(i.) apical dark part incompletely developed and pterostigmatic fascia rather narrow; (ii.) apical dark part completely developed and pterostigmatic fascia rather broad.

Species of *Panorpa* frequent shady places, often resting on a leaf; they are dull insects, easily captured. They live chiefly on animal matter, preferring dead or dying insects or other small animals, and probably but seldom capturing living prey. Occasionally, at any rate, they will feed on vegetable juices, &c. It seems doubtful if the weaker and less active insects, comprising the genus *Panorpodes*, are carnivorous at all. They are more mountain-loving insects, and are sometimes attracted by light. Species of *Bittacus* prefer places more shady than those affected by *Panorpa*. They suspend themselves from a branch or leaf by the legs (usually the fore ones). Generally, but not entirely, their food is living insects which they capture. A life-history given is that of *Panorpa klugi*, already noticed in 'Entomologist,' vol. xlv. p. 271.

Miyake is inclined to reduce the number of genera and species of Japanese Mecoptera, but he describes four new species:—*Panorpa arakawa*, *Panorpa hokusanensis*, *Bittacus takaoensis*, and *B. marginatus*, and five new subspecies. Besides six figures in the text there are ten excellent plates.

W. J. LUCAS.

*A Revision of the Ichneumonidae. Based on the Collection in the British Museum (Natural History). With Descriptions of New Genera and Species. Part II.—Tribes Rhyssides, Echthromorphides, Anomalides, and Paniscides. By CLAUDE MORLEY, F.Z.S., F.E.S. Pp. i–xii and 1–140. Printed by Order of the Trustees of the British Museum. 1913.*

THE two hundred and ninety-eight species here dealt with belong to the subfamilies (1) Pimplinae and (2) Ophioninae, each of which comprise two tribes as follows:—(1) Rhyssides, numbering six genera and seventy-two species (ten new), and Echthromorphides, two genera and thirty-two species (six new). *Pyramishyssa*, Mocs., is also mentioned in the table of genera, but is not otherwise referred to. (2) Anomalides, sixteen genera (five new), and one hundred and eighteen species (thirty-eight new); Paniscides, six genera (one new), and seventy-six species (seventeen new). *Labrorychus*, Först., and *Erigorhus*, Först., are also given in the table of genera.

In preparing this valuable revision, the author had the advantage of ready access to Museum types, without which labour of this kind would have been almost futile.

The plate, which is in colour, represents a male specimen (much enlarged) of *Certonotus geniculatus*, Morley, reproduced from a coloured drawing by Mr. Rupert Stenton, who presented it to the British Museum.



*Type Species of the Genera of Ichneumon Flies.* By HENRY L. VIERECK. Pp. 1-186. Washington Government Printing Office. 1914. (Smithsonian Institution, United States National Museum, Bulletin 83.)

FIXING the type of a genus is often a difficult business, but when the type of each of some two thousand genera has to be ascertained the task becomes almost herculean, and the warmest thanks of entomologists are due to those who devote their time and ability to such labours.

This catalogue, which is alphabetical in arrangement, deals with the Ichneumonidæ of the world. Genotypes are designated where this important matter had not been previously made clear by the founder of the genus, or a type selected by a later writer. A very large number of genera are monobasic, the term used to express a genus based on a single species.

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*Common British Beetles.* By Rev. CHARLES A. HALL, F.R.M.S. Containing 28 Illustrations, viz.: 8 full-page plates in colour, 15 in black and white from photographs, 5 drawings in the text. Pp. i-viii and 1-88. London: Adam & Charles Black. 1914.

THIS is one of a series of very inexpensive volumes entitled "Peeps at Nature," published by Messrs. Black, and edited by the Rev. C. A. Hall. It is excellent in every way, and the hope expressed by the author that it "will be the means of arousing a more general interest in beetles" is one which we cordially endorse and trust will be fully realised.

The plates, both coloured and plain, are surprisingly good for this class of work, and the species selected for figuring just those that are most likely to come under the notice of the nature student. The text is admirable, the author having been careful to be not only accurate but also entertaining.

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*Transactions of the City of London Entomological and Natural History Society for the years 1912 and 1913.* Pp. 66. Plates i.-vii. The Society, Hall 20, Salisbury House, Finsbury Circus, London, E.C. 1914.

In addition to Reports of Field and Ordinary Meetings, there are several papers of interest in this volume, among which "Notes on *Cænonympha pamphilus*," by Mr. Harold B. Williams; "Notes on *Thera variata* (Schiff.) and *T. obeliscata* (Hb.)," by Mr. L. B. Prout; and "Some Lycænid Notes, with a Discussion of the Segmentation of the Abdomen in Lepidoptera," by Dr. Chapman, may be specially mentioned. Six of the plates representing genitalia and androconia are from photographs by Messrs. F. N. Clark and A. E. Tonge.

It may be noted here that this Society will in future be known as the London Natural History Society, with which the late North London Natural History Society is also incorporated.



*The Journal of the Board of Agriculture of British Guiana.* Vol. vii. No. 3. January, 1914. Demerara: "The Argosy" Company, Limited, Georgetown.

AMONG various entomological contributions published in this number the following is perhaps the most important: "The Scale Insects of British Guiana. A Preliminary List, with an Account of their Host Plants, Natural Enemies, and Controlling Agencies," by G. E. Bodkin, B.A., Dip. Agric. (Cantab.).

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*Proceedings of the South London Entomological and Natural History Society for 1913-14.* Pp. i-xvii and 1-158. Plates i.-ix. The Society, Hibernia Chambers, London Bridge. 1914.

ENTOMOLOGICAL papers, seven in number, are as follows:—  
 "Tinea pallescentella, Stainton (=nigrifoldella, Gregson). Some Notes on its Life-history and its History," by Mr. Robert Adkin (pp. 1-6, plate i.); "Spring in the South Tyrol," by Mr. Ebray Sich and Mr. Alfred Sich (pp. 7-17); "One of our Common Butterflies, *Epinephele jurtina*," by Mr. Hy. J. Turner (pp. 18-25); "British Short-horned Grasshoppers," by Mr. W. J. Lucas (pp. 26-34, plates 2-4); "Mimicry in the North American Butterflies of the Genus *Limenitis*," by Prof. E. B. Poulton (pp. 35-37); "The Ithomiinæ," by Mr. W. J. Kaye (pp. 38-48, plate 5); "Entomology with a Camera in Switzerland," by Mr. Hugh Main and Mr. K. G. Blair (pp. 49-53, plates 6-8). Plates 3 and 4, showing British Grasshoppers, are reproduced from photographs by Mr. Lucas. Plates 6 and 7 exhibit the life-history of the Tiger Beetle, and plates 8 and 9 give the life-history of the ant-lion; all the figures are from photographs by Mr. Main. Plate 1, representing *Tinea pallescentella*, natural size and greatly enlarged, also details of life-history, is from drawings by Mr. Frohawk.

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We have also received the following:—

Reprints from the *Proceedings of the United States National Museum*. Vol. 46 (1913); Vol. 47 (1914).

North American Spring-tails of the Subfamily Tomocerinae. By Justus W. Folsom. (Vol. 46, pp. 451-472, with plates 40-41.)

New Hymenoptera from North America. By A. B. Gahan. (Vol. 46, pp. 431-443, with Plate 39.)

Descriptions of twenty-three New Genera and thirty-one New Species of Ichneumon-flies. By Henry L. Viereck. (Vol. 46, pp. 359-386.)

New Species of Noctuid Moths from Tropical America. By William Schaus. (Vol. 47, pp. 485-549.)

A Contribution towards a Monograph of the Homopterous Insects of the Family Delphacidae of North and South America. By David L. Crawford. (Vol. 47, pp. 557-640, with plates 44-49.)

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## AN EXPEDITION IN SEARCH OF RUSSIAN BUTTERFLIES.

BY W. G. SHELDON, F.E.S.

So far as I am aware, out of the hundreds of expeditions British lepidopterists have made into almost every part of Europe during the last thirty years, not a single one has had this great country for its goal, though I believe one or two have incidentally collected a few specimens there on their way further east.

Foreigners travelling in Russia at present are not very numerous, and such as there are consist almost entirely of those who have business in the country; and I may say that in my journey of about two months, during which I travelled about five thousand miles, I saw only one German, and not a single American, Frenchman, or Englishman, until Moscow was reached on my return to England.

The prospect of undergoing the rigid Customs examination frightens a good many timid ones; the passport regulations are, perhaps not without reason, the cause why a good many more possible visitors do not reach Russia, and seriously this question is always an anxious and it may very easily become a disastrous one, for an individual in Russia who cannot produce a passport is looked upon by the authorities as a very suspicious person; he must stay in the town where he happens to be until they are satisfied of his bona fides, which will usually take many days, possibly some weeks, and if he is a little indiscreet he will very probably spend the time in prison. Then, apart from the fact that it is not very difficult to lose a document, a foreign passport has considerable value to those subjects of the Czar who wish to leave Holy Russia, but whom the authorities of that country do not desire to part with; consequently there are always people on the lookout to steal your passport, and they do not by any means lack opportunities. On the frontier it is taken from you, passed by an official, and then after the luggage has been examined, which will take a considerable time, another

official calls out the name on each passport of the whole train-load of waiting people, and if you do not recognize your name when it is called out, and someone else claims your precious document, it disappears, and there you are !

Immediately you have taken a room in a hotel, the proprietor demands your passport, for which he does not give a receipt. It is handed over to the police by him, and you get it back before you leave the town. At your last place of stay it pays an additional visit to the police to have stamped upon it permission to leave the country ; and on your return journey it is taken from you several hours before you get to the frontier, and only returned at the last Russian station.

No, travelling in Russia is not likely to be popular with foreigners so long as the present passport regulations exist ; the Russians themselves recognize this, and there is an agitation going on at the moment to get them done away with.

My thoughts had often been centred on Russian Lepidoptera, but I had fancied that it was rather too tough a problem to be tackled during a summer holiday.

There are certain parts in the west and north-west which it is quite easy to reach, but the butterflies found there are generally too western in type to be novel, and one can get nearly everything with equal facility, and under much more favourable conditions of sojourn, in eastern Germany, or in Scandinavia.

The interesting parts of the country from a lepidopterist's point of view are unquestionably those which are the most remote from England ; and these are by no means easy to reach, where time is an object, and when one gets there, at the end of about a week of travel, there are various reasons, as will be seen hereafter, which make the average family man think hard before he finally decides to collect Lepidoptera in remoter Russia.

One can get very little reliable information in England respecting Russia. The ubiquitous Cook knows it not, and railway tickets from London are only issued to Moscow, St. Petersburg, and Odessa. Bradshaw, in the Continental edition, professes to give time-tables of all the trains in every part. One wonders whence they were obtained, and if such trains really ever did run, for all I tested turned out to be hopelessly inaccurate, and there is no reason to suppose they were in any way exceptional.

Baedeker, until this year, had only a somewhat ancient edition, in French or German, but within recent months a new one, in English for the first time, was issued. I was not aware of this edition until I called upon the British Consul-General at Odessa. This gentleman gave me this very useful piece of information, and further very kindly lent me a copy, which was of immense assistance.

On mentioning my project to the companion of my Spanish expedition of last year, Mr. A. H. Jones, I was very glad to find that he was able and willing to come with me once more, and we left London on the evening of April 29th, for Odessa, which was reached after a most uninteresting journey of seventy-two hours, during which, after crossing the Channel to Flushing, we did not pass through a single tunnel.

I wished before the more serious entomological work of the journey commenced to see something of the beautiful south coast of the Crimea. On the day following our arrival at Odessa we therefore got on board the Black Sea steamer, landing the following morning at the famous fortress of Sebastopol.

We spent a couple of days at Sebastopol, which were occupied in visiting scenes of the principal events of the siege of sixty years ago, not doing any actual collecting, but we saw a good number of butterflies, and the district impressed us as better ground for Lepidoptera than any we afterwards saw in the Crimea. The valley leading from Sebastopol to the English Cemetery appeared particularly promising.

On May 7th we hired a carriage and drove to beautiful Ialta, a drive that will always remain vividly impressed upon my memory for the loveliness of the scenery *en route*. Apart from the interest of the journey, we were much impressed with the manner in which the three little Tartar horses dragged the four-wheeled carriage, ourselves, our luggage, and the driver, the whole distance of sixty-one miles, without turning a hair, galloping uphill and downhill equally as on the level. The route is for the first half of the distance inland. Balaclava is passed on the way, and then one gradually mounts upwards, between woods—full of wild pæonies at the time of our visit—until a col named the “Porte de Baidar” is surmounted, then all at once the beautiful south coast bursts into view from a height of almost 2000 ft. The day was perfect, and the sea almost as blue as the Mediterranean can be; the view itself is superb, and the conditions we saw it under were the best possible. Beyond Baidar the road is entirely alongside the sea, which is never lost sight of, and vistas of surpassing loveliness continually burst into view. Just before Ialta is reached, the Imperial Palace and Park of Livadia are passed. The Czar was in residence, and the road, and in fact the whole district, was patrolled by picked Cossacks, magnificently mounted and armed. It was an impressive scene!

Ialta is in situation and surroundings very similar to Mentone, but it is even more beautiful. The vegetation is, however, not so southern; one sees plenty of cypress trees and occasional palms, and in the main street I saw several fine specimens of *Jacaranda mimosæfolia*, which just then were a gorgeous mass of purple tubular flowers; but with few exceptions



the flowers and trees of the Crimean southern coast are those commonly met with in mid-Europe.

We spent five days at Ialta, during which the weather was favourable, and we were able to explore every day for Lepidoptera. I must say I was much surprised and disappointed to find how western they all were. Scarcely a species was seen that cannot be found in the Alps. The only butterfly we noticed that was at all eastern in its distribution was *Pyrgus orbifer*, which was not uncommon. *Colias erate*, *Zegris eupheme*, and *Plebeius zephyrus*, amongst other species, are said to occur, but we did not see any of them. A plant that is very like *Astragalus exscapus*, the food-plant of *P. zephyrus*, was, however, abundant locally by the roadside near Aloupka, some ten miles from Ialta. Most of the ground that seemed promising is enclosed, and a considerable part is vineyards, and there is very little space to collect in. Butterflies were by no means common either as individuals or species, except in one or two instances. Hibernated examples of *Libythea celtis* were pretty frequent, although we did not see any trees of *Celtis australis*.

On the evening of May 12th we once more boarded the steamer, landing the following day at Novorossisk, on the east coast of the Black Sea.

Novorossisk is a seaport of considerable size, and trades in corn, timber, and other commodities. It is situated at the base of what I suppose one might call the foothills of the Caucasus Mountains, which have an altitude here of from 1500 ft. to 2000 ft.

We stayed five days, and during that time explored the surrounding mountains and valleys as much as possible.

I was again much surprised at the western character of both vegetation and Lepidoptera. Many of the little dingles seemed very like those one meets with at home; the sides were clothed with elm and ash and oak, and many of the common English flowers grew beneath.

The only eastern butterfly we came across was *Erebia afer*, which was not uncommon some distance up the mountains. Unfortunately, we were a month too late for it, and nearly all the specimens captured were more or less *passé*.

We found some good ground amongst the hills to the north of the town, but the best was undoubtedly the valleys and mountains south of the harbour.

In planning an expedition which had for one of its objects the making acquaintance with as many eastern butterflies as possible, it seemed to me that there were three districts which were worthy of consideration.

First, there is the great range of the Caucasus Mountains, magnificent in scenery, historic in the past ages, and peopled with some of the most fascinating races in the world. All of

surpassing interest to the tourist; but when one comes to go a little closely into the question, it becomes evident that there is something to be said on the other side of the question.

There is a strip of mountainous coast extending along the eastern shores of the Black Sea from Novorossisk to Batoum—beautiful throughout and very tempting; but, says Baedeker, reeking with malaria, every bit of it! and independent testimony, including the verdict of the British Consul at Novorossisk, confirms Baedeker. Even Novorossisk itself is very malarious in certain parts of its environs.

No less scathing is Baedeker about the sanitary condition of the whole range, which he describes as malarious throughout, even in the mountains. And then the people! Brigands almost all of them, more or less! The published returns testify to many hundreds of cases of highway robbery annually, and even life is by no means safe. It might be possible to do something in one or two well-frequented places, but elsewhere, to be in safety, you must collect your specimens under the guns of an armed escort, enveloped in a mosquito net, and even Lepidoptera lose their charm when studied under such conditions!

Secondly, there are the Ural Mountains. I am not aware that the objections I have named respecting the Caucasus as a centre apply to this district; and I may say that, so far as I am aware, out of the Caucasus life and property are as safe at the present moment in Russia as in any other European country. But the Urals are situated rather too far north to produce the majority of the eastern species that affect Russia. Further, I gather that the accommodation is poor and objectionable from many points of view, and that only Russian is spoken; and I think I can go so far as to say that a sojourn there, unless one had a courier and could spend it under canvas, would be anything but enjoyable, if not impossible, from our point of view.

There remain the steppes of the south-east in the basins of the great rivers, the Ural and the Volga. This region, from all the reports I have seen, contains the greatest number of desirable Lepidoptera of any district in Russia, and to it I felt strongly drawn. The chief difficulty to be surmounted was one which applies more or less to all parts of Russia: how to avoid the uncleanliness and disease which unfortunately are only too prevalent everywhere. Even in the large towns sanitation is almost unknown; in the hotels, with the exception of a very few, the beds are verminous. Cholera, typhus, and other objectionable acquaintances are more or less endemic, and often epidemic; and, of course, in the small towns and in the villages matters are very much worse. One would have liked to settle down in some district which had never been worked, but the objections to such a course were so manifest that I felt compelled to pause.

In this dilemma an idea came into my head which seemed

to offer a feasible solution of my difficulties, and this was contained in the blessed word Sarepta. One finds it immediately the study of European butterflies is commenced enshrined in the classic pages of Kane, and described as the haunt of almost everything eastern; and Staudinger and every other authority confirm this view, and quote it on innumerable occasions.

The great blessing of Sarepta from my point of view was the fact, known to me, that its population consisted chiefly of Germans; and surely one could obtain with them clean accommodation and wholesome food, and, further, the risk of sickness to be apprehended elsewhere would be avoided, or very much lessened, in their town.

About one hundred and fifty years ago that extraordinary woman the Empress Catharine the Second, who then ruled the fortunes of Russia, was desirous of colonising the country around the Volga, and her own people not being then sufficiently civilised to form suitable colonists, she induced great numbers of Germans to settle there, granting them great tracts of free land and freedom from military service, and conferring other important privileges upon them. At the present day there are dozens of these colonies, the inhabitants of which are still largely of German extraction, and Sarepta is the most southern of them. It is situated on the right bank of the Volga some three hundred miles from its mouth.

I do not know who discovered Sarepta entomologically, but Edward Eversmann in his '*Fauna Lepidopterologica Volgo-Uralensis*,' published in 1844, and still the standard work on the Lepidoptera of Eastern Russia, was well acquainted with it. In his preface he speaks of two brothers of the name of Kindermann spending the summers of 1838 and 1839 collecting Lepidoptera there. He also mentions that an entomologist named Zwick had still earlier collected Coleoptera and Lepidoptera in the same place. Since the days of Eversmann the best known investigator has been a German resident, H. Christoph, who collected insects for Staudinger, and from whom most of the numerous specimens in our National Collection at South Kensington, which are labelled Sarepta, came. Christoph undertook several expeditions into the Caucasus and other parts of Asiatic Russia, and resided at Sarepta until about twenty-five years ago; his son still lives there; most of his specimens in the National Collection date back about fifty years from the present time. Another German resident of Sarepta, a botanist of the name of Becker, seems to have studied Lepidoptera as well as botany, and I am informed he made an extensive collection of the former, which is still in the district.

The town seems from time to time to have been visited by entomologists from Germany, but I have been unable to find any results of their investigations in print, though there may be some in the magazines of that country.



The left bank of the Volga almost along its whole length is flat, but the right bank on which Sarepta, as before mentioned, is situated, is an almost continuous range of hills, in some places attaining a height of over 1000 ft.; at Sarepta they are from 200 ft. to 300 ft. in altitude. These hills have apparently been formed in the long distant past by the prevailing wind from the east blowing the sand formed in the river bed into dunes; these dunes being in the process of time converted into solid earth by the growth of plants, the roots of which have bound the soil together. The tops and sides are generally covered with a growth of low plants; in the folds and cross ravines, however, there are woods and bushy slopes full of life of all kinds, insect and otherwise.

The Volga, which above Sarepta flows for several hundred miles in a south-west direction, skirting for the whole distance the base of the hills, has within comparatively recent times carved out for itself a new course which commences immediately north of the town; this course leaves the hills and strikes out across the steppe in a south-easterly direction. At Sarepta the distance from the river to the hills is about two miles, and the town lies on the level plain midway between the two.

Having decided to make a stay of several weeks at Sarepta, we left Novorossisk on the evening of May 18th, bound thither. The distance is about 500 miles, across the steppe the whole distance, in traversing which we did not see a hill or even an undulation; it was a weary journey, which the train is timed to do in twenty-four hours, and which it actually accomplished in twenty-seven hours. This journey we did on bread, cheese, and beer, for we were warned at the last moment at Novorossisk, too late to take a supply of food with us, that the more solid eatables to be had on route were bad, and that it was dangerous to partake of them.

At Sarepta I had obtained through a German correspondent the address of a person who kept an inn, the only one there, and on arrival, to our great relief, we found airy rooms, clean beds, and wholesome, if rough, food, and in Herr Georg Enke a most obliging, intelligent, and helpful host.

I must confess that it was with a feeling of keen disappointment that I surveyed my surroundings on the morning after our arrival. I had expected to find Sarepta, which contains some six thousand people, a model town. I had pictured the steppe, by some well-thought out scheme of irrigation, made to blossom like the rose, and the whole district converted into vineyards, fruit orchards, and gardens. There is some spasmodic irrigation, but not by any means sufficient to transform the arid plain into fertility, only just enough to water a few gardens. There is no evidence of want of prosperity of a kind, with plenty of good houses, for Russia, even some fruitful and



shady gardens; but the whole is hardly what one expected from a German population; it was Germany of the eighteenth century, modified and not improved by the sojourn of its inhabitants for one hundred and fifty years in Russia. The streets are unpaved, except for one or two short lengths of cobbles, so rough that when we drove over them we wished they too had not been paved; undrained, and unscavenged, full of hollows, in which the water stands in great pools after every storm; and the sandy surface everywhere churns up into seas of mud almost knee deep during wet weather.

One of the first things I noticed at Sarepta was that the window openings, outside the glass, had wire gauze shutters to exclude insect pests; I inquired if there was any malaria in the town; the reply I got was somewhat evasive, and later on I was told that it was not so bad as in the surrounding country. We were both provided with mosquito curtains, which we slept under, and avoided as much as possible going near swamps; probably in consequence of these precautions we did not suffer any inconvenience; but mosquitoes were not infrequent in our rooms, and one captured on my curtain has been identified at the British Museum as the malaria-conveying species, *Anopheles maculipennis*. It appears, therefore, that future visitors should take precautions against this pest. I suspect that malaria is pretty universal throughout Eastern Russia.

The flora of the steppe did not come up to the expectations I had formed of it. I had looked to find a sward of brilliant flowers, but the growth is almost entirely *Artemesia*, grey and fragrant, of several species, and low growing, some six inches high; oxen and horses seem fond of it, camels devour it greedily, and the entire steppe smells of it.

In places on the slopes of the hills there is a good deal of a fine dry wiry grass, the food of *Melanargia* var. *suwarovius*, and here and there one comes across a certain number of flowering plants; a brilliant purple sage is one of them, a bright pink *Helichrysum* another, there is a blue *Linum*, and several species of *Phlomis*, but the whole are not in sufficient numbers to produce any broad effect.

The railway passes along the base of the hills, and upon its banks we found excellent collecting ground; there was here a luxuriant growth of many species of leguminous and other plants, and amongst them could be found such desirable butterflies as *Colias erate*, *Glaucopsyche cælestina*, *Scolitantides pylaon*, *Zegris eupheme*, and many others.

The glory of Sarepta is, however, the "Tschapurnik Wald," a large wood, the property of the community, and used by it for picnics and other kinds of recreation; it occupies a hollow in the hills some four miles to the south-west of the town. This wood and the adjacent bushy slopes have glades which are

carpeted with a very luxurious growth of flowers, and it is one of the most prolific localities for butterflies I have ever seen; the nearest approach to it I know is the famous wood at Pészer, near Budapest, to which it is very similar in many respects. Amongst the brilliant and interesting flowers growing here were fine bushes of the common garden plant *Gypsophila paniculata*, and the almost equally well known *Thalictrum flavum*; these two plants were especially attractive to the Thecladæ, four species of which I, on one occasion, saw on a plant of *G. paniculata*. In the glades, too, *Melitæa trivia* swarmed, and a little earlier *Cænonympha leander* and *Parnassius mnemosyne* were equally abundant. In this wood *Pararge clymene*, so rare in Central Europe, was an abundant butterfly; and many others, the names of which alone would make the mouth of a lepidopterist water, were to be found in profusion.

Perhaps more striking even than the Lepidoptera in this wood, and in fact in the whole district, were the birds. Golden orioles fluted in every tree; brilliant bee-eaters hovered overhead; still more brilliant rollers performed their curious aerial antics; hoopoes in dozens, unmistakable in plumage and in note, were there; amongst the Raptores, particularly noticeable were the buzzards, many scores of pairs of which were breeding in the "Tschapurnik Wald"; one small oak copse, crowning a eminence, which had been defoliated by the larvæ of *Tortrix viridana*, had the appearance of a rookery, so thickly were the trees crowded with the old and new nests of this species. Hobbies, kestrels, goshawks, and at least three species of day-flying owls swarmed everywhere. The whole formed the most extraordinary assemblage of bird life I have ever seen, and one which it would be difficult to equal anywhere.

Other excellent ground was a series of cross valleys, in the main face of the range of hills, some few miles to the north-west of Sarepta, and in the direction of the large town of Tsaritsyn, which is some twenty miles distant.

These cross valleys had on their lower slopes a good deal of wood, with which the bottoms were generally filled, and in them were found much the same species as in the "Tschapurnik Wald," in addition to which they were the headquarters in the district of *Neptis lucilla*, *Melanargia* var. *suwarovius*, *Hesperia tessellum*, *Lycaena arion*, and *Polyommatus amandus*.

There are cross valleys in the hills opposite Sarepta also, but these are much inferior in flora and fauna to those above-mentioned, and we found them hardly worth investigating.

The magnificent hornet-like parasitic hymenopteron, *Scolia flavifrons*, was abundant everywhere on flowers.

Lepidoptera were distinctly local, and it entailed a great deal of hard work in prospecting to get a fair idea of the district fauna; probably this was the reason why we did not see certain

butterflies that have been reported from Sarepta, and which we expected to come across. The most notable of these was *Pontia chloridice*, which we were much disappointed not to find anywhere, although a sharp look-out was kept for it, and every swift-winged white that there was the slightest suspicion of was diligently netted, when this was possible. Other species that we expected to see, but did not, included *Satyrus autonæ*, *S. hippolyte*, *Oeneis tarpeia*, *Triphysa phryne*, and *Scolitantides barius*; probably we left too early for the first two species, and arrived too late for the third and fourth; with respect to the last-named butterfly, it is, I believe, always rare in Russia, and possibly it occurred further afield than we were able to work.

We were at Sarepta from May 19th until June 23rd, between which dates the weather was almost perfect; bright sun from morning until evening on almost every day was our fortunate lot; and there was always a cool and most invigorating breeze to temper its rays.

On June 23rd we started on the return journey, travelling up the Volga as far as Nijni Novgorod, a distance of about 1200 miles, which took the steamer six days to accomplish. The Volga boats are excellent, well fitted up, and the cuisine arrangements exceedingly good; the voyage, apart from being a little monotonous, is interesting, and after our hard work was very restful and enjoyable.

I was struck with Nijni Novgorod and its district as an entomological centre; it is in the neighbourhood of what looks like a great deal of promising country, which should repay investigation. From Nijni to Moscow is only ten hours by rail; after staying a few days at the latter city I came straight to England, parting from Mr. Jones at Warsaw, en route for the Tyrol.

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## AUSTRALIAN HALICTINE BEES.

By T. D. A. COCKERELL.

### *Parasphecodes atronitens*, sp. n.

♀. Length about  $9\frac{1}{2}$  mm.; entirely black, the flagellum obscure brown beneath; clypeus shining, strongly but not densely punctured, and with a short median sulcus; front appearing granular, more or less glistening, especially at sides; hair of face and front very scanty, fuscous, but at sides of face appearing pale and glistening in some lights; cheeks with shining white hair; mesothorax dull, extremely densely punctured, the punctures clearly visible under a lens; scutellum dullish, densely very minutely punctate, with a depressed median line or sulcus; area of metathorax minutely and obscurely subplicate basally, and with a raised median line, but otherwise without sculpture; tubercles with a dense fringe of greyish white hair;



mesothorax and scutellum with scanty fuscous hair; tegulæ piceous, shining dark reddish posteriorly; wings dusky hyaline, stigma and nervures sepia, outer nervures weakened; first r. n. joining second s. m. at extreme apex; middle and hind tibiæ and tarsi with fuscous hair on outer side; first two abdominal segments shining, finely punctured, the others dull, and without distinct punctures, except the piliferous ones; venter with silvery white hair, on the apical segments with fuscous.

*Hab.* Calsundra, Queensland, October 30th, 1912 (H. Hacker; Queensland Museum, 88). Closely related to *P. plorator*, Ckll., but the wings are not so dark, and the punctured first two abdominal segments are highly distinctive. *P. fumidicauda*, Ckll., is larger, and has a very different metathorax.

*Halictus melanopterus*, sp. n.

♀. Length nearly 10 mm.; black, including the legs and antennæ; head broad, with white hair, which is thin on face, conspicuous on cheeks; long pale golden hairs from a fringe below lower margin of clypeus; clypeus and supraclypeal area shining, distinctly but not densely punctured; front entirely dull except at sides, where it is somewhat glistening; thorax with thin white hair, quite abundant on pleura, mesothorax and scutellum with inconspicuous fuscous hair; tubercles (as seen from in front) ending in a point; mesothorax and scutellum shining, very finely and quite closely punctured; scutellum sulcate in middle; area of metathorax large, bulging at sides, very finely roughened, without distinct sculpture; posterior truncation shining; tegulæ rufopiceous; wings strongly stained with blackish, stigma rufopiceous, nervures sepia; outer r. n. and t. c. weakened; second s. m. broad, receiving first r. n. a short distance before end; hind legs with dark fuscous hair over knees; abdomen shining, very finely punctured; long-triangular patches of dull white tomentum at basal sides of segments 2 to 4; apex with dark fuscous hair; no ventral scopa.

*Hab.* Yallingup, near Cape Naturaliste, S.-W. Australia, September 14th–October 31st, 1913 (R. E. Turner). British Museum. *H. melanopterus* is very near *H. instabilis*, Ckll., but larger, with darker wings and darker stigma, and the abdominal bands not entire. The abdomen is much like that of *H. circumdatus*, Ckll., but the metathorax is quite different. It is much larger than *H. chapmani*, Ckll., and is readily known from *H. convexus*, Sm., by its dark wings.

*Halictus disclusus*, sp. n.

♂. Length about 6 mm.; black, with the first three abdominal segments bright chestnut-red, but the first dark basally and with a large dusky median cloud, second and third segments with a dark spot at each laterobasal corner; knees, tibiæ and tarsi ferruginous, the tibiæ (the first slightly, the last most) stained with blackish; head broad, eyes strongly converging below; clypeus prominent, with a broad pale yellow apical band; labrum black; mandibles whitish



in middle, red apically; face and front with dull white hair; antennæ long (reaching to end of thorax), entirely black; flagellum crenulate beneath; mesothorax and scutellum dull, the surface microscopically tessellate, the very minute punctures not clearly visible under a lens; area of metathorax finely and weakly plicatulate, the sculpture fading toward the apex; hair of thorax thin, dull white, with a faintly yellowish tint on scutellum; tegulæ black; wings dusky hyaline, stigma and nervures reddish sepia; second s. m. very narrow; abdomen shining.

*Hab.* Eaglehawk Neck, S.-E. Tasmania, February 12th-March 3rd, 1913 (R. E. Turner). British Museum. Resembles *H. tasmaniae* (Ckll.), but easily known by the dull mesothorax. The black antennæ and absence of metallic colour separate it from *H. hedleyi*, Ckll.

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## A SUCCESSFUL HUNT FOR SOME OF OUR LOCAL CRAMBI.

BY THE REV. JOHN W. METCALFE, F.E.S.

THE following notes are put together mainly with a view to the possible usefulness to others of our experience gained in collecting certain Crambi, which, if plentiful in their restricted haunts, are not only very local but may easily be missed owing to their retiring habits. Incidentally a few other local species will be mentioned, which are not commonly taken in such numbers as we were fortunate enough to meet with. My companions on this expedition, which lasted from July 13th to 31st, were the Revs. W. G. Whittingham and J. E. Tarbat, and it is well to mention at once that the weather was as adverse throughout the whole time as it well could be—wet, cold, and windy, a fact which made our subsequent success the more noteworthy.

Our first halting place was a very happily situated boarding house in the middle of the well-known Deal sandhills. If the accommodation it afforded was not palatial, the position was all that the collector could desire. During the ten days we spent there we were pleased to see *Lithosia lutarella* var. *pygmeola* in profusion; indeed, whatever the weather was like it appeared on the wing or sitting on the marram in great numbers. By day *M. lineata*, *H. cespitalis*, *C. angustalis*, and *S. ictericana* were common, but *A. ochrata* was practically over. However, our special object of desire was *C. contaminellus*, and the stirring of an occasional specimen by day from the marram gave us the cheering assurance that it was about. Yet not till we discovered that at night it loves to sit an inch or two above the ground, on the patches bare of marram, did we secure it in any numbers. From this discovery onwards we took it in plenty, together

with some beautiful varieties, notably a few very dark, almost black, with pale nervures, a striking form. Many were taken paired and in perfect condition. Its first flight is just after dark, when it keeps close to the ground, and is therefore easily missed; while it is again on the wing late at night, when it flies higher.

Thanks to a chance discovery two other local insects, of very secretive habits, were taken in profusion. On a cold afternoon with a strong wind blowing we were searching unavailingly the lower leaves of *Echium vulgare* for pupæ of *O. dentalis*. As we in this way disturbed the collection of dead leaves and grasses at the roots of the *Echium*, first a specimen of *N. achatinella* crawled out, and then, to our delight, one of *M. bipunctatus* (*anellus*). Further search produced a good many more of each species, together with some commoner things, the insects having evidently retired to the roots for shelter after feeding by night at the blossoms. This gave us the hint we needed, and the next night, which was pitch dark and very warm, we visited the plants with our lanterns. The result was truly amazing! *N. achatinella* was about in profusion flying over or sitting upon the *Echium*, while far surpassing them in numbers was *M. bipunctatus*. Of this strange-looking and not often seen insect only the males appeared to fly at all, and these but little, both sexes, many paired, sitting on the *Echium* and neighbouring grasses. The males at rest had a curious intermittent vibration of the wings, resting quiet for a few seconds, then a sudden dithering of the wings, and then quiet again. Whether the movement was intended to attract the females or not we failed to discover. The night was evidently a field one with *bipunctatus*, as on no subsequent occasion did we see it in anything like such numbers, indeed, I question whether the like ever has been seen. The fact that so sluggish an insect was found so abundantly, one or two actually in process of expanding their wings, in the middle of the more settled part of the sandhills, seems to point to the roots of the marram, or of some other grass, as the food of the larva rather than to the generally accepted suggestion that the larva lives in the nests of wasps.

The same night a single insect, not yet identified, was taken. It is evidently allied to *E. cribrum*, but has the fore wings pure white with much fewer markings, and the hind wings considerably darker. It will probably prove to be a wanderer from the Continent; at any rate, it does not appear to belong to any species usually recognised as British. Before leaving Deal a trip to St. Margaret's Bay produced a number of Tortrices, the most interesting of which were *C. fulvana*, *G. nigromaculana*, *C. dilucidana*, and *P. aspersana*, whilst from gathered heads of *Centaurea scabiosa* a number of fine *C. gigantana* (*alternana*) subsequently emerged. *A. baliodactyla* and *M. phæodactylus*

were on the wing, but *A. gilvaria* and *E. ochroleuca* were only just appearing.

Mr. Tarbat having to leave us, Mr. Whittingham and I next journeyed to the Norfolk coast. Our first object of ambition was *Crambus fascelinellus*, which I had found fairly plentiful two years ago. In the distressingly cold atmosphere not a specimen could be induced to fly in the daytime, and not more than two or three were found at rest in the sandpits. Our hopes were accordingly fixed on what could be done at night, and at first they seemed doomed to be disappointed. Careful searching, however, revealed the fact that *C. fascelinellus* was about. It was found sitting, like *C. contaminellus*, an inch or two above the ground, but only on the spots, at the back of the sandhills, where a few scattered blades of grass struggled up through the sand. It seldom sat on the marram or on other grasses where these latter grew thickly, the surface of the sand had to be well in evidence, and in such spots we took a fine series. There was a very short and partial flight at dusk, which would probably have been larger and more general in warmer weather, and the insect again flew after ten o'clock.

The best part of a day, spent in water up to our knees and with frequent storms beating down upon our heads, produced two dozen larvæ or pupæ of *N. canna*, and they were well earned.

Finding that *C. fascelinellus* was beginning to get wasted we next directed our attention to *C. alpinellus*, which Mr. Whittingham had turned up two years previously. Our experience was most interesting. Still dogged by hostile elements our expectations were not great, and when, at our first essay, ten o'clock struck without a sign of the Crambid we began to despair. It was bitterly cold, but we knew that it must be hiding somewhere. Then the happy thought struck us of placing our lamps on the ground, shining straight into the tangled roots of the marram. Almost instantly a little moth began jumping out towards the light, and then another, and our pleasure was great when we found that *alpinellus* had been moved at last. Later on the weather improved, and with it the tale of our captures of this species. On a fine afternoon there is a very general flight between six and seven o'clock, the Crambid being then not only on the wing on its own account, but also easily induced to fly by tapping the fir trees where it evidently shelters as frequently as in the marram. On one such afternoon we must have captured fully seventy specimens in an hour and a half. The delicate fringes of the hind wings soon get worn, but many of the captures were freshly emerged and in splendid order.

One other insect seems worthy of note. This is the recently discovered *Retinia purdeyi*, which flew round the branches of the Austrian pines (at least such we took the trees to be) in the late afternoon. Difficult to capture in a wind, it occurred in



great plenty if the sun shone, and on a calm day it was quite possible to get five or six in the net at once. *C. pinetellus* and *C. inquinatellus* also sheltered in the fir trees, whilst a few *S. coniferana* and *E. atricapitana* were to be had, the latter having evidently flown up from the ragwort beneath. Altogether we brought back some six or seven hundred good insects apiece, which was excellent work for three weeks of thoroughly bad weather.

# KAKOTHRIPS, N. GEN., A DIVISION OF THE GENUS FRANKLINIELLA (THYSANOPTERA).

By C. B. WILLIAMS, B.A., F.E.S.

DURING the past two years I have been investigating the life-history of a species of Thysanoptera which does considerable damage to peas and beans in this country, with a view to finding

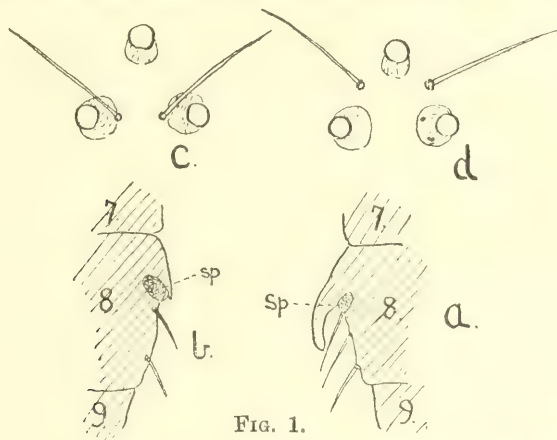


FIG. 1.

some method of control; and a full account will be published shortly (Annals of Applied Biology). The species has been known up to the present by many different names:—*Thrips pisivora*, *Physopus robusta*, *Euthrips robusta*, and *Frankliniella robusta*, the latter being at present the most correct terminology. The species has never been properly described, Uzel's original description ("*Physopus robusta*," Monographie der Ordnung Thysanoptera, 1895, p. 104) being insufficient for modern demands. In making a careful examination of a number of specimens for a proper technical description (which will appear in the above-mentioned paper) I found that this species differs in several respects from all other known species of the genus *Frankliniella*. Uzel (*l. c.*) had already noted that the male of this species has a pair of processes on the abdomen, one on



each side of the eighth segment (fig. 1, *a*). I find that there are also distinct vestiges of these processes present in the female (fig. 1, *b*). They are, in both sexes, immediately in front of the spiracle of the eighth segment. No such organs occur, so far as I know, in any other species of the suborder Terebrantia, but something similar is found in some genera of the Tubulifera. Thus in *Megathrips nobilis* (Bagnall, Ent. Mon. Mag. xx. 1909, p. 131) there are lateral processes on the sixth and eighth abdominal segments. This feature would alone almost justify the separation of *robusta* from the genus, but I find further that in this species the two long ocellar spines are between the two posterior ocelli (fig. 1, *c*), whereas in all the other species of *Frankliniella* which I have been able to see, or in the descriptions of which these spines are mentioned or figured, they are between the posterior and anterior ocelli (fig. 1, *d*).\*

Further, the larva of *robusta* has the last two abdominal segments dark-coloured, a feature more characteristic of the larvæ of the Tubulifera, and which does not occur in the larvæ of any of the species of *Frankliniella* that I have observed.

On the above grounds I am removing *robusta* from the genus *Frankliniella*, and propose the name *Kakothrips* for a new genus to contain it, characterised as follows:—

#### KAKOTHrips, new genus.

= *Physopus*, Uzel (*l. c.*), in part.

= *Frankliniella*, Karny (Mitt. Nat. Ver. Univ. Wien, viii. 1910, p. 45), in part.

Antennæ eight segmented. One long spine at each front angle, and two at each hind angle of the prothorax. *Ocellar spines between the two posterior ocelli.* Maxillary palps three jointed, labial palps two jointed. Fore vein of the upper wing set regularly throughout its whole length with short spines. *Lateral processes on each side of the eighth abdominal segment in the male curving backwards and upwards, in the female rudimentary but distinguishable.* Larva with ninth and tenth abdominal segments dark.

Type (and at present only species), *K. robustus*.

The characters in italics distinguish it from *Frankliniella*.

Fuller particulars of the species itself will be given as mentioned above.

\* They are certainly in this position in the following species:—*intonsa* (Trybom) (= *vulgatissimus*, Uzel); *tenuicornis* (Uzel); *melanommata*, Williams; *fusca* (Hinds); *stylosa* (Hood); *tritici* (Pergande); *insularis* (Franklin); *helianthi* (Moulton); *occidentalis* (Pergande, *teste* Hinds); *cephalica* (Crawford); *nervosus* (Uzel, *teste* Hinds); *floridensis* (Morgan); *runneri* (Morgan); *gossypii* (Morgan). But *sulphurea*, Schmutz, would appear from the description to be possibly like *robusta*, and in *minuta* (Moulton) they are small or absent.

The John Innes Horticultural Institution,  
Merton, Surrey: July, 1914.

*PHYTODECTA VIMINALIS*, A VIVIPAROUS  
BRITISH BEETLE.

By C. B. WILLIAMS, B.A., F.E.S.

ON May 11th, 1913, adults and larvæ of *Phytodecta* (*Gonioctena*) *viminalis* were found in numbers on some willow bushes in the New Forest. A close search was made for eggs but none were found, although quite young larvæ, apparently just hatched, were common. A female was then found which seemed to be ovipositing, but on the leaf were only a group of very small orange larvæ, nor was there any trace of egg-shells, though it was indicated from the uneaten condition of the leaf that they had only just hatched. The latter observation in particular suggested so strongly the possibility of viviparity that numbers of the adults were brought back for closer examination. It was then found that the surmise was correct, and females were watched in captivity and were seen to lay small orange-coloured larvæ quite free of any shell or enveloping membrane. Further, on dissection of females about to lay, many similar young larvæ were found quite free of any shell in the lower part of the ovary and oviduct.

Viviparity has been recorded in the allied genus *Orina* by various writers; in *O. vittigera*, *O. cacaliæ*, and *O. gloriosa* by Chapman and Champion (Trans. Ent. Soc. 1901, p. 1-7), in *O. superba* and *O. speciosa* by Perroud (Ann. Soc. Linn. de Lyon, 1855, p. 402-8), and in *O. speciosa* var. *venusta* by Bleuze (Petites Nouvelles Entomol. October 1st, 1874, and Ent. Mo. Mag. xi. 1874, p. 136), but so far as I am aware it has not been recorded in the genus *Phytodecta* or in any British beetle. According to Perroud *O. superba* only lays one larva at a time at intervals of about twelve hours, so that this species differs slightly from the one under consideration.

The only account of the life-history of *Phytodecta viminalis* is by Cornelius in 1857 (Stett. Ent. Zeit. xviii. p. 165). In the specimens he observed, however, eggs were laid which hatched on the first day. He describes the eggs as reddish in colour and cylindrical, slightly pointed at the ends. It would appear, then, that the same species can, under different conditions, be either viviparous or oviparous.

The life-history of the beetle is as follows:—

The adults emerge from hibernation towards the end of April (three were found on April 19th, 1914). Both sexes are very active in the sunshine, and in the early part of May pair many times. They have a habit of sitting at the base of a leaf with the head pressed right into the axil; this has also been observed in the allied South European species *P. variabilis* by Bateson (Proc. Zool. Soc. Lond. 1895, p. 850). They fall to the ground if disturbed. They eat readily the leaves of the rough

broad-leaved willows (*Salix caprea*, *cinerea*, &c.), on the upper side of which they lay their young, but I could get neither the adults nor the larvæ to feed on the willows with long and smooth leaves (*S. alba*, &c.).\* The young all appear to mature at the same time, and are laid, if the female is not disturbed, in one batch. The number in one family varies from twenty-eight to forty. With one doubtful exception, none of the thirty females from which I obtained young laid a second batch, as occurs, for example, in the Coccinellidæ.

The young larvæ when first laid are orange yellow, but they rapidly darken and become quite black. The larva, at least when older, has a pair of dorsal, protrusible vesicles close together between the seventh and eight abdominal segments. They are pink in colour and can be extended about one-twelfth of an inch when the larva is disturbed. The larva is full-fed in about fifteen days, when it descends to the ground and becomes quiescent; it is not till four to six days later that the bright orange pupal stage is assumed. The sexes of the pupæ can be easily distinguished both by the size and by the form of the ventral surface of the last two abdominal segments. Shortly before emergence the legs and head, the centre of the prothorax and the scutellum become quite dark, and the wings darken slightly.

The adults emerge after about twelve days, the total time from the laying of the young larva being about thirty-three days. Actual dates are as follows:—Larvæ laid, May 15th; full-fed, June 2nd; pupated, June 8th; emerged, June 20th. The adults then remain for the whole of the rest of the year on the willows without producing a second brood; hibernate, probably among the dead leaves, &c., on the surface of the ground, and emerge again in the following spring, when they pair and lay the young of the next generation.

The original parents, having laid their young in May, continue feeding and survive for the rest of the year, so that from the end of June onwards there are adults of two generations together on the plants. Several females which laid young in May, 1913, and which therefore emerged from the pupa in June, 1912, were still alive in November, 1913, giving an adult life of at least eighteen months. All, however, perished during the winter.

I hope next year to study the life-history in more detail, and also recommend to anyone the observation of the method of reproduction of allied species. I should be much indebted to any reader who could let me have living adults of *P. rufipes* in the spring.

\* Cornelius (*l. c.*) makes the interesting remark that larvæ which he found on *Salix aurita* refused to eat *S. caprea*, although other larvæ laid on the latter took it quite readily.



## NOTES AND OBSERVATIONS.

LYMANTRIA MONACHA, ab.—I have been crossing and breeding a strain of *Lymantria monacha* for the past two or three years, with the object of obtaining dark and banded forms, in which I am meeting with some success. This year one brood produced several specimens with the crimson bands on the body replaced with yellow, a change which is of course most striking in the female, making it look almost a different moth. None of my entomological friends hereabouts have ever seen such a variety before, and I cannot find any mention of yellow bodied *L. monacha* in any of the books I possess. I may mention that the strain I am dealing with shows no sign of deterioration as yet, the imagines I have bred this year being for the most part much larger than those captured wild, while the fertility of the ova and the proportion of larvæ to feed up were very high.—C. RIPPON, F.E.S.; Springfield House, Abingdon-on-Thames, August 10th, 1914.

VARIETIES OF LYCENA CORYDON, L. ICARUS, &c.—I had the pleasure of taking in Bucks a very remarkable specimen of *Lycena corydon* var. *strata*, the spots on the under side being replaced by beautiful streaks. A very similar form of *L. icarus* likewise fell to my net in Oxon. In May I captured two fine specimens of the unicolorous form of *Ematurga* (*Fidonia*) *atomaria* (var. *unicolorata*). They were taken within a few yards of the place where I obtained two similar forms in 1890, and recorded in the 'Entomologist' for January, 1891.—A. J. SPILLER; Chinnor, Oxon.

EARLY EMERGENCE OF SMERINTHUS OCELLATUS × AMORPHA POPULI (HYBRIDUS, Steph.).—I think it may be of interest to record the emergence yesterday (August 18th) of a fine specimen of the above-mentioned hybrid. The larva went down on July 17th—only a month and a day before the appearance of the imago. I should much like to know if this is a record for this hybrid. No forcing was attempted. I might add that from a pairing that I obtained (by assembling for wild *ocellatus* males, in preference to using bred males, and then caging with *populi* female) on May 30th of this year, eighty-one ova resulted, forty-seven hatched, and of these thirty-seven successfully pupated between July 15th and August 10th.—SYDNEY WHICHER; Westmead, Liss, Hants.

EUCHLOË CARDAMINES IN EAST CUMBERLAND.—The orange tip is not a common insect in this part of the country. It may therefore be of interest to note that on June 15th, 1914, I saw two males upon the wing together on the banks of the Tyne close to Alston. The food-plant (*Cardamine pratensis*) is common all over the district, and, incidentally, it may be remarked that the double-flowered form of it is fairly numerous in the district.—GEORGE BOLAM; Alston, Cumberland.

AMMOPHILA SABULOSA, Linn., AND DASYPODA HIRTIPES, Latr., IN WORCESTERSHIRE.—I think it may be worth while placing on permanent record that I have taken this summer these two species of Aculeate Hymenoptera in Worcestershire; the former on August



8th, on Hartlebury Common, and the latter—a male—on July 27th, when sweeping a field adjoining the same sandy waste. Saunders ('Hymenoptera Aculeata of the British Islands,' 1896, pp. 88 and 273) of the first states that, saving Lancashire, he has "no other northern or midland localities for it," and concerning the second that "it is recorded from very few inland localities."—J. W. WILLIAMS; M.R.C.S., Stourport, Worcestershire.

Since forwarding the above note I have been fortunate enough to find a large colony of *D. hirtipes* on Hartlebury Common. The bank on which this colony is situated faces 23° E. of S., and slopes at an angle of 20°. It is interesting to notice that *Nomada solidaginis*, Pz., is visiting these burrows. I also saw one *N. sexfasciata*, Pz., enter a burrow on August 14th (a somewhat late date for this "cuckoo") and extracted the intruder. The common fossor, *Cerceris arenaria*, Linn., inhabits the same site.—J. W. WILLIAMS.

CHRYSOPHANUS PHLEAS IN PICCADILLY.—On July 30th last I saw a perfectly fresh specimen of *Chrysophanus phleas* on the window sill of the front room of my flat looking out on Piccadilly, near Burlington House. The butterfly had apparently only just emerged. May it have been bred in the Park near by?—HAROLD HODGE; 54, Piccadilly, W., August 16th, 1914.

EGGS OF PRIONUS CORIARIUS (COLEOPTERA).—Recently in the New Forest I found a fine female of this Longicorn beetle on a piece of fallen beech, where apparently it was ovipositing. After killing the beetle I eviscerated it and removed from the abdomen a large number of eggs (some two hundred perhaps). Each egg was about 4.5 mm. in length, and about 1.6 mm. in greatest width; it was granulated in appearance, but with no definite markings; in shape it was a very slightly curved cylinder with rounded ends, one being much more pointed than the other. They were creamy white in colour, and some put in spirit remained so; but others exposed to the air became yellowish. A very large centipede (*Lithobius*) taken from the same tree had a number of the eggs given it, and it fed on them readily. The object of this note is to record the fact, for no doubt it would eat them in a state of Nature, presuming it could find them; and the centipede has its home in the decaying wood in which apparently the eggs are laid.—W. J. LUCAS; Kingston-on-Thames.

WICKEN FEN.—So few people have any real knowledge of the Fen Lepidoptera and their life-histories that a word of warning is necessary. As to *Acronycta strigosa*, Wicken Fen was never the locality where these were beaten, and I should say there were few hawthorn bushes in the Fen. I have beaten the larvæ with the late Mr. Albert Haughton (father of the present collector), but it is much scarcer now. The Fen itself wants very careful handling, and it is possible to do a good deal of mischief in a short time. For instance, we were told last June that a piece of the Fen owned by the National Trust, which contains particular species of its own, was to be cut. I believe Mr. Edelston took steps to prevent this, but if it had been carried out much harm would have been done. In parts of the Fen the willow bushes want a great deal of thinning out, but discrimination is necessary, and the Fen growth cannot be treated as jungle to be

demolished. The National Trust should appoint an expert Committee to deal with the matter, and at least one member should be familiar, from actual field work, with the life-histories of the principal Fen Lepidoptera, such as *Papilio machaon*, *Meliana flammea*, *Nonagria arundineta*, *N. arundinis*, *Cidaria sagittata*, &c. It is probable that a uniform treatment of the Fen is undesirable, and that while some portions are never cut (with the exception of thinning out sallow bushes, &c.), others should be cut periodically.—A. ROBINSON; Bretanaby, Chislehurst, August 26th, 1914.

MOTHS CAPTURED BY LIGHT-TRAP (continued from p. 228):—

JUNE.—*Spilosoma lubricipeda*. 2nd (one).—*Phalera bucephala*. 5th (one); 11th (one); 13th (one)=3.—*Opisthograptis luteolata*. 5th (two); 10th (one); 11th (one)=4.—*Rusina tenebrosa*. 5th (one); 12th (five); 16th (one)=7.—*Dianthæcia cucubali*. 2nd (two); 5th (one); 10th (two); 12th (one); 16th (one)=7.—*Hipoerita jacobææ*. 2nd (one); 11th (one)=2.—*Cidaria truncata*. 2nd (one).—*Cabera pusaria*. 2nd (one); 11th (one); 16th (one)=3.—*Thera variata*. 2nd (one); 11th (one)=2.—*Neuria reticulata*. 2nd (three); 5th (one); 9th (one); 11th (one); 13th (one); 15th (one); 17th (two); 18th (two)=12.—*Agrotis exclamationis*. 1st (one); 2nd (two); 3rd (two); 5th (eight); 6th (one); 8th (two); 9th (four); 10th (fourteen); 11th (sixty-two); 12th (thirty-two); 13th (thirty-two); 14th (fifteen); 15th (twenty-seven); 16th (forty-three); 17th (seventeen); 18th (nine)=271.—*Hama sordida*. 6th (one); 9th (two); 10th (four); 11th (two); 12th (four); 13th (four); 14th (two); 15th (three); 16th (one); 17th (one); 18th (one)=25.—*Agrotis cinerea*. 2nd (four); 5th (five); 18th (one)=10.—*Eupithecia oblongata*. 2nd (two).—*Dianthæcia capsicola*. 2nd (one); 13th (one); 14th (one)=3.—*Caradrina morpheus*. 5th (one); 11th (five); 12th (one); 15th (two); 16th (five); 17th (nine); 18th (five)=28.—*Eupithecia vcnosata*. 5th (one).—*Apamea basilinea*. 2nd (five); 5th (four); 6th (two); 9th (two); 10th (one); 11th (two); 12th (two); 13th (one); 14th (four); 15th (one); 16th (one); 17th (four); 18th (two)=31.—*Noctua rubi*. 6th (one).—*Mamestra dentina*. 2nd (nine); 3rd (one); 5th (six); 9th (one); 10th (three); 11th (eleven); 12th (seven); 13th (one); 14th (six); 15th (three); 16th (three); 17th (four); 18th (four)=59.—*Leucania comma*. 5th (six); 6th (one); 9th (two); 11th (six); 12th (ten); 13th (four); 14th (three); 15th (five); 16th (three); 17th (six); 18th (five)=51.—*Xanthorhoë montanata*. 6th (one).—*Plusia gamma*. 3rd (one); 5th (four); 6th (one); 10th (one); 11th (twelve); 12th (seventeen); 13th (six); 14th (three); 16th (two); 17th (two)=49.—*Abrostola tripartita*. 2nd (one).—*Dianthæcia carpophaga*. 2nd (two); 5th (one)=3.—*Anaitis plagiata*. 3rd (one); 16th (one)=2.—*Grammesia trigrammica*. 2nd (three); 5th (one); 10th (one); 11th (four); 12th (two); 14th (one)=12.—*Agrotis segetum*. 9th (one); 11th (one); 13th (one); 14th (two); 17th (one)=6.—*Spilosoma menthastri*. 2nd (seven); 5th (three); 8th (one); 9th (two); 10th (two); 11th (five); 12th (seven); 13th (two); 14th (eleven); 15th (two); 16th (sixteen); 17th (five); 18th (two)=65.—*Xanthorhoë fluctuata*. 10th (one); 17th (one); 18th (one)=3.—*Smerinthus ocellatus*. 11th (one).—*Acidulia immutata*. 11th (one).—*Mamestra*

*thalassina*.—11th (three); 12th (one); 16th (two)=6.—*Pachys betularia*. 11th (two); 13th (one)=3.—*Mesoleuca ocellata*. 11th (one); 13th (one); 16th (one); 17th (one); 18th (two)=6.—*Eustroma silaceata*. 11th (one).—*Triphæna pronuba*. 11th (one).—*Agrotis putris*. 11th (one); 15th (one)=2.—*Leucania pallens*. 12th (one); 13th (two); 17th (one); 18th (two)=6.—*Cucullia umbratica*. 12th (one); 15th (one)=2.—*Trigonophora (Phlogophora) meticulosa*. 13th (one).—*Mamestra oleracea*. 13th (one).—*Smerinthus populi*. 13th (one).—*Plusia chrysitis*. 15th (one); 17th (one)=2.—*Agrotis puta*. 15th (one).—*Phibalapteryx vitalbata*. 16th (one).—*Plusia pulchrina*. 17th (one).—*Noctua primule*. 17th (one).—*Acontia luctuosa*. 18th (one).—*Agrotis corticea*. 18th (three).—*Timandra amataria*. 18th (one).

JULY. — *Geometra vernaria*. 7th (one).—*Caradrina morpheus*. 7th (two); 8th (one); 16th (one); 17th (one); 19th (three); 20th (eight); 21st (ten); 22nd (three); 26th (one); 27th (three); 28th (three); 29th (one); 30th (one); 31st (one)=39.—*Leucania conigera*. 8th (one); 16th (one); 17th (one); 19th (two); 22nd (one); 31st (one)=7.—*L. pallens*. 8th (one); 16th (two)=3.—*Agrotis exclamations*. 8th (two); 16th (one); 17th (one); 19th (three); 27th (one)=8.—*Dianthæcia capsicola*. 8th (one).—*Caradrina taraxaci*. 8th (one).—*Agrotis strigula*. 8th (one).—*Plusia chrysitis*. 16th (one).—*Ematurga atomaria*. 16th (one).—*Apamea secalis*. 16th (two); 17th (one); 18th (one); 20th (four); 21st (two); 22nd (three); 27th (three); 28th (four); 30th (one)=21.—*Triphæna pronuba*. 16th (one); 22nd (one); 28th (one)=3.—*Xylophasia lithoxylea*. 16th (one).—*Plusia gamma*. 16th (one); 19th (one); 20th (six); 24th (one); 26th (one); 27th (two); 30th (one)=13.—*Agrotis segetum*. 16th (one).—*Malacosoma neustria*. 17th (one).—*Boarmia gemmaria*. 17th (one).—*Xylophasia monoglypha*. 18th (one); 20th (one); 21st (one); 27th (one); 28th (one); 30th (one)=6.—*X. sublustis*. 18th (one).—*Cidaria pyraliata*. 19th (one).—*Hecatera serena*. 19th (one); 20th (one)=2.—*Lithosia lurideola*. 19th (one); 21st (one); 25th (one)=3.—*Leucania impura*. 19th (one); 20th (one); 28th (two); 30th (two)=6.—*Hydræcia nictitans*. 19th (one); 21st (three); 27th (two); 28th (one); 29th (one); 30th (three)=11.—*Pachys betularia*. 19th (one).—*Mesoleuca ocellata*. 19th (one).—*Ortholitha limitata*. 19th (one).—*Opisthograptis luteolata*. 20th (one); 28th (one)=2.—*Dianthæcia cucubali*. 20th (two); 27th (one); 28th (one)=4.—*Cilix glaucata*. 20th (two).—*Leucania lithargyria*. 20th (one).—*Ligdia marginata*. 20th (one); 27th (one)=2.—*Selenia bilunaria*. 20th (one); 27th (one); 31st (one)=3.—*Zeuzera pyrina*. 20th (one).—*Perizoma alchemillata*. 20th (one); 27th (one)=2.—*Cerigo matura*. 20th (two); 27th (one); 29th (one); 30th (one); 31st (one)=6.—*Campptogramma bilineata*. 20th (one).—*Mamestra oleracea*. 21st (one).—*Cabera pusaria*. 21st (one).—*Noctua brunnea*. 21st (one).—*Acidalia dimidiata*. 21st (one).—*Bombycia viminalis*. 27th (one).—*Coremia ferrugata*. 28th (one); 29th (one)=2.—*Crocallis elinguaris*. 28th (one).—*Triphosa dubitata*. 28th (one).—*Amphipyra tragopogonis*. 29th (one); 31st (one)=2.—*Caradrina quadripunctata*. 30th (one).—*Hydriomena furcata*. 31st (one).—R. M. PRIDEAUX; Brasted Chart, Kent, June 16th, 1914.



## RECENT LITERATURE.

*A Monograph of the Jumping Plant-lice or Psyllidæ of the New World.* By DAVID L. CRAWFORD. Pp. 182; plates 30. Smithsonian Institution, United States National Museum. Bulletin 85. Washington. 1914.

THE author finding that classification of the Psyllidæ on wing venation alone was unsatisfactory, placing as it does closely related species in different genera and even subfamilies, presents a new system based largely on a study of structural characters other than venation.

The one hundred and seventy-five species in twenty-nine genera here enumerated and described are arranged under six subfamily headings, in the following sequence:—

Subfamily Liviinæ.

	Tribe Liviini ... ..	1 genus ( <i>Livia</i> ), 5 species.
	„ Aphalarini ... ..	2 genera, 22 species.
Subfamily	Pauropsyllinæ ... ..	3 genera, 15 species.
„	Carsidarinae ... ..	4 genera, 13 species.
„	Ceriacreminae ... ..	1 genus, 2 species.
„	Triozinae... ..	8 genera, 44 species.
„	Psyllinæ.	
	Tribe Pachypsyllini...	3 genera, 9 species.
	„ Euphyllurini ... ..	2 genera, 6 species.
	„ Arytainini ... ..	3 genera, 18 species.
	„ Psyllini ... ..	2 genera, 41 species.

Among other matters of interest treated in the introductory pages (1-18), morphology is discussed in considerable detail.

An extensive bibliography is given.

*Pond Problems.* By E. E. UNWIN, M.Sc. Pp. xvi + 119. (Cambridge Nature Study Series.) Cambridge: University Press. 1914.

THIS book supplies a series of lessons on Pond Life, intended for the lower forms of Secondary Schools and upper standards of Elementary Schools. It is above the average of such books, and we venture to think that much of the work would be suitable for higher forms in the Secondary Schools (if time could be found for it), and that any entomologist, especially one who is given overmuch to collecting simply, might study it with advantage. The aim of the series of practical lessons and demonstrations is really to give some ideas from actual contact with Nature "about environment, natural selection, and evolution." After showing how material should be obtained, and making quite clear what an insect is, our author states that "insects are really land animals," even though now in a comparatively few cases they may pass part of their life in the water. The main object of the remaining lessons is, by practical observation and experiment, to show how the adaptation to their new surroundings is managed. The work concludes with useful appendices on material, apparatus, the microscope and the making of microscope-slides, and a short bibliography. The book, which is well got up, is illustrated by forty-seven good figures, all, except two, from the author's draw-



ings or photographs. We might say that to us it appears better to use the term nymph, instead of larva, or larva and nymph, for the whole of the early stages of insects with incomplete metamorphosis (hemimetabolic).

W. J. L.

We have also received the following Reprints from *Proceedings of the United States National Museum*. Vol. 47 (1914):—

No. 2045. Names applied to the North American Bees of the Genera *Lithurgus*, *Anthidium*, and Allies. By T. D. A. Cockerell. Pp. 87-94. (May 7th.)

No. 2048. Hymenoptera, Superfamilies Apoidea and Chalcidoidea, of the Yale-Dominican Expedition of 1913. By J. C. Crawford. Pp. 131-134. (April 30th.)

No. 2046. The Noctuid Moths of the Genera *Palindia* and *Dyomyx*. By Harrison Dyar. Pp. 95-116. (May 7th.)

No. 2050. Report on the Lepidoptera of the Smithsonian Biological Survey of the Panama Canal Zone. By Harrison C. Dyar. Pp. 139-350. (May 20th.)

No. 2043. New Genera and Species of Micro-Lepidoptera from Panama. By August Busck. Pp. 1-67. (April 30th.)

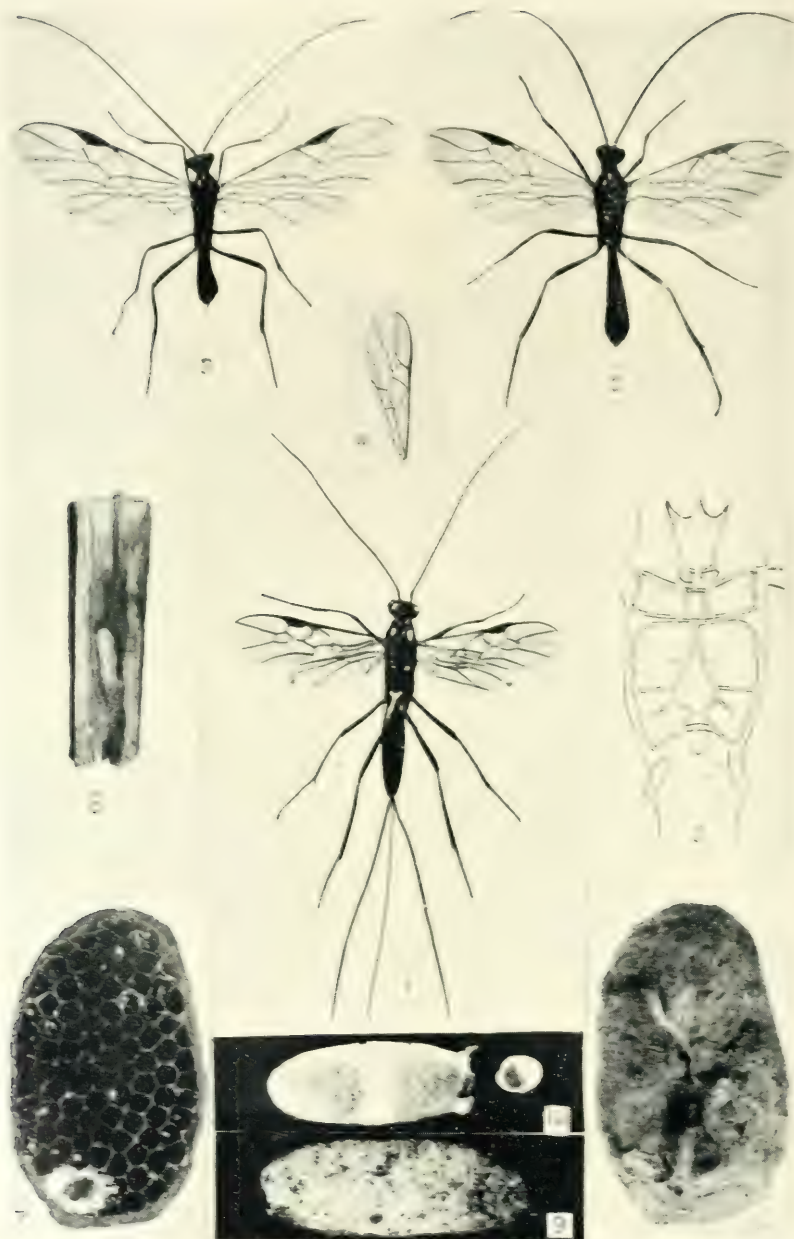
## OBITUARY.

H. T. DOBSON.

ALL who knew him will regret to hear that a genial member of the entomological fraternity has passed away in the person of Mr. H. T. Dobson, of New Malden. A somewhat exacting business in London, municipal work in Malden and Southwark, as well as affairs connected with his local Congregational Church, of which he was a deacon, made large calls on his time; but Mr. Dobson was a keen lover of Nature, and this fourth form of activity received its due share of attention. In his younger days he was a keen fisherman, and he was also much interested in gardening, but birds and insects were his chief delight. For more than forty years he had been an entomologist. Since 1884 he had been a member of the South London Entomological and Natural History Society. In 1895 he was elected a Fellow of the Entomological Society of London. Though notes from his pen have appeared occasionally in entomological periodicals, he did not add much to the literature of his subject. For some years he had been in poor health, and as time went on he was able to do an ever decreasing amount of field work, but he never lost interest and went on collecting in the limited space afforded by his garden at New Malden. As he retained full use of his arms when walking became impossible, he was able to go on adding to his collections, and preparing the specimens so kindly sent him for his valuable and well-kept cases of birds. He finally retired from business in January last, and died on June 27th at the age of sixty-one, leaving a widow and three sons to mourn his loss. We understand that he left directions for his collection to be sold.

W. J. LUCAS.





Prepared by T. Lee

1. *Microgaster marginatus*, female, x 4.
2. *Zile repentinus*, female, x 2.
3. Wing of *Zile repentinus*, x 2.
4. *Urocyba* wing *Zile repentinus*, x 2.
5. Dorsal view of *Microgaster marginatus*, x 4.
6. Section of the same.
7. Section of the same.
8. Section of the same.
9. Section of the same.
10. Section of the same.

# THE ENTOMOLOGIST

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[No. 617

## CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ. No. 2.—MACROCENTRIDÆ, WITH DESCRIPTIONS OF TWO NEW SPECIES.

By G. T. LYLE, F.E.S.

(PLATE VI.)

THE insects of this small family were first separated from *Rhogas* by Curtis in 1832 and 1833,\* when he brought forward the genera *Macrocentrus* and *Zele*. Förster proposed two additional genera, the one, *Amicroplus*, a division of *Macrocentrus*, and the other, *Homolobus*, a dismemberment of *Zele*.† Ashmead has raised the genera of Curtis to the dignity of tribes,‡ which is quite necessary if Förster's genera be accepted, for a glance will show that *Amicroplus* and *Homolobus* cannot rank equally with *Macrocentrus* and *Zele*: indeed, Marshall considered that Förster's genera were founded on characters purely specific.§ Our few British species may, for convenience, be treated under the two original genera:—

Abdomen elongate, sessile; fore wings with three cubital areolets, radial areolet elongate.

- (1) Spurs of hind tibiae very considerably shorter than half the metatarsi; first abdominal segment not or scarcely longer than the second; terebra at least as long as the abdomen . . . . . *MACROCENTRUS*.
- (2) Spurs of hind tibiae as long as half the metatarsi, first abdominal segment much longer than the second; terebra short . . . . . *ZELE*.

I must again express my thanks to various entomologists who have presented me with specimens, to Dr. D. Sharp and Mr. H. F. Bailey for the loan of books, to Mr. Claude Morley, who, with his usual kindness, has sent me for inspection several insects from his collection, to Col. Nurse for a similar courtesy,

\* Ent. Mag., vol. 1.

† Synop. der Fam. und Gatt. der Braconen. 1802.

‡ "Classification of Ichneumonidae." Proc. U.S. Nat. Mus., vol. 40, p. 118.

§ "Species des Hym. d'Europe et d'Algérie," vol. 9, p. 228.



to Mr. R. South for confirming the names of hosts, and to Mr. B. S. Harwood, of Colchester, who has sent me for examination a considerable number of specimens, most of which have come to him from the collection of the late E. A. Fitch. Although the main part of the Fitch collection is now in the Essex Museum at Stratford, it would seem that the insects which are at present in the possession of Mr. Harwood were put on one side in store-boxes, some as duplicates and others as being unnamed, or to await naming, and have so remained for the past twenty years or more.

In the following notes, unless otherwise stated, the records are my own, and the insects mentioned have been captured or bred in the New Forest.

### MACROCENTRUS, Curtis.\*

Gregarious or solitary parasites of larvæ of Lepidoptera. Ratzeburg records one species as having been bred from the coleopteron *Anobium pertinax*, but this has never been confirmed. The general colour of these insects is black with rufous or testaceous markings. In the few cases where I have noticed the larvæ, they have been elongate and whitish without any very noticeable markings. It is possible that in all the species the larvæ may be partially external parasites, for with *M. abdominalis* and *M. equalis* I have found that, although internal feeders when small, the larvæ feed for three or four days as external parasites after emerging from their host, during which time they rapidly increase in size.

- |      |  |                               |
|------|--|-------------------------------|
| (8)  | 1. Antennæ with forty-five or more joints.                                 |                               |
| (3)  | 2. Third abdominal segment (like the two preceding) entirely striolate     | 1. <i>abdominalis</i> (Fab.). |
| (2)  | 3. Third abdominal segment smooth, or striolate at base only.              |                               |
| (7)  | 4. Body entirely black.  |                               |
| (6)  | 5. Stout species, wings clouded  | 2. <i>marginator</i> (Nees).  |
| (5)  | 6. Slender species, wings hyaline  | 3. <i>nitidus</i> (Wesm.).    |
| (4)  | 7. Thorax rufous   | 4. <i>thoracicus</i> (Nees).  |
| (1)  | 8. Antennæ with forty or less joints.                                      |                               |
| (12) | 9. Second abscissa of radius as long as the first intercubital nervure.    |                               |
| (11) | 10. Body entirely black, terebra longer than body                          | 5. <i>infirmus</i> (Nees).    |
| (10) | 11. Thorax partly rufo-testaceous, terebra not longer than the abdomen     | 6. <i>equalis</i> (sp. nov.). |
| (9)  | 12. Second abscissa of radius much shorter than first intercubital nervure | 7. <i>collaris</i> (Spin.).   |

*M. abdominalis*, Fab.†—Without doubt the commonest species in the genus, having now been recorded as bred from nearly

\* Ent. Mag., vol. i., p. 187.

† Ent. Systematica, 2, 183.

thirty different species of Lepidoptera. A gregarious parasite, generally of the larvæ of Tortricina or Tineina. This is the *Rogas linearis* of Wesmæel,\* from whose description and that of Marshall † I have identified my specimens, not having seen the original description of Fabricius. Marshall describes four distinct varieties, and although the numerous broods that I have reared in the New Forest have all been typical, I have captured the var. *pallipes*. It is recorded that Van Vollenhoven bred this variety mixed with typical specimens from the same victim, which is quite contrary to my own experience, nor is it borne out by the many broods from the Fitch collection which I have examined. It has often been stated that the broods invariably consist of one sex only, and so I had always found them until July, 1914, when, from a larva of *Tortrix ribeana*, I obtained a brood composed of a single male and eighteen females; the male appeared some thirty-six hours before any of the females.

In some specimens I find that the stroliation at the base of the third abdominal segment is very faint. As a rule, the second cubital areolet is open outwardly, that is, the second cubital nervure is obsolete. I have a specimen of the var. *pallipes*, however, which has the second cubital areolet distinctly closed.

The cocoons are brown, thin, shining and enveloped in a thin whitish web; they are usually found in bunches between the leaves which have been "rolled" by the hosts. A period of from three to four weeks elapses between the emergence of the parasite larvæ from their host and the appearance of the perfect insects. I have noticed that, after emerging from their host, the larvæ feed as external parasites for two or three days; in fact, until the edible parts of the host are entirely consumed.

Bred from *Tortrix ribeana*, June 23rd, 1911 (eight females), July 3rd, 1912 (twelve females), July 4th, 1912 (thirteen males); from *T. lichæana* (ten females); from *T. viridana*, July 14th, 1912 (six females); from *Depressaria alstromeriella*, July 10th, 1912 (four females). Harwood has two specimens (var. *pallipes*) labelled "ex caja, W. Sherston." In Fitch's boxes are broods obtained by Elisha from *Depressaria nanatella* and *Gelechia mouffetella* (both broods var. *pallipes*); from *Depressaria alstromeriella*; *Gracilaria clongella*, July 14th, 1885; *Cerostoma xylostella*, July 31st, 1882, and *Ebulea crocealis*; also broods from *Ennychia octomaculalis*, September 22nd, 1881, bred by W. R. Jeffery; and from *Botys verticalis*, bred by G. T. Porritt. ‡

*M. marginator*, Nees. (Fig. 1.)—This is the enemy of the Sesidiæ, having been bred as a solitary parasite from the larvæ of many members of the family. It is the largest and stoutest

\* Nouv. Mém. Ac. Brux., p. 173.

† Trans. Entom. Soc. 1888, p. 193.

‡ Some of these broods were recorded by Fitch, Entom. xiv. 143, and xvi. 68.

species of the genus to be found in Britain, measuring sometimes as much as 16 mm. across the expanded wings; the size, however, varies, specimens often expanding no more than 12 mm.

It would seem that the female is much more frequently met with than the male; for instance, in February, 1914, L. W. Newman sent me twenty-two living specimens which he had bred (forced, of course) from larvæ of various *Sesidæ*, and all were females, and Col. Nurse, who has bred the species commonly, has obtained females only. My own experience is that the females outnumber the males by ten to one.

The cocoon is brown, thin, and shining, larger, but not so elongate, nor so dark in colour as that of *M. thoracicus*. It is always constructed within the burrow of the host (fig. 8). I have specimens bred by Newman from larvæ of *Sesia respiformis* and *S. culiciformis*, taken at Bexley; others bred by Tonge from *S. culiciformis*, July 17th to 24th, 1911; from *S. chrysidiiformis*, May 22nd, 1911; and from *S. formiciformis*, May 11th, 1912; all the hosts taken near Reigate. Harwood has found it commonly at Colchester, and Nurse in West Suffolk. I have frequently bred it from New Forest larvæ of *S. respiformis* in May, and have found the cocoons in burrows of *S. tipuliformis* at Burgess Hill, Sussex, and Sherborne, Dorset.

*M. thoracicus*, Nees.—A well-marked species, easily distinguished by the rufous thorax; always a solitary parasite. In the New Forest it appears to be fairly plentiful, and I have several times bred it in July and August from larvæ of *Phibalocera quercana*, also once from larva of *Chimabacche fagella*, August, 1913. I have captured it in May.

Among Fitch's insects are three males, bred from *Phyeis betulella* by H. Bartlett, June 29th, 1880, and June 30th, 1882; also a specimen labelled "Darenth Wood."

The cocoon is dark brown, narrow, elongate, and constructed between the leaves, which are spun together by the host. When bred from *P. quercana*, the cocoon is found under the flat web which the larva of the lepidopteron constructs beneath a leaf.

Marshall states\* that Bignell bred it from *Noctua triangulum* and *Xylina ornithopus*; these seem rather unlikely hosts, and it is strange that Bignell makes no mention of them in his South Devon list, but merely states that he bred the species from "larvæ feeding on sallows."

This insect is sometimes confused in collections with *Eubadizon extensor*, L., to which it bears a superficial resemblance.

*M. nitidus* (Wesm.).—On May 5th, 1910, I captured a female, and on May 15th, 1914, a male which I have no hesitation in referring to this species, not before recorded as British. My

\* Trans. Entom. Soc., 1888, p. 196.



specimens agree with Wesmael's description, except that the head, thorax, and stigma are dark fuscous instead of black. Very similar in shape and size to *M. thoracicus*, but differing in that the thorax and stigma are black or blackish, the antennæ 46-jointed, and the second abscissa of the radius not longer than the first intercubital nervure. From *M. infirmus* it differs in size, in the length and number of joints of the antennæ, and in many other ways; from *M. marginator* in size, in the wings being hyaline and not clouded, and also in the first abscissa of the radius being considerably shorter than the first intercubital nervure.

*M. infirmus* (Nees).—Somewhat similar to *M. collaris*, but differing in having stouter legs, a much longer terebra, and in the second abscissa of the radius being as long as the first intercubital nervure.

In Fitch's boxes are four, one male and three females; these were probably once in Marshall's collection, one card being marked "St. A." (St. Albans) in his writing.\*

*M. equalis* (sp. nov.).

Fuscous, disc of mesothorax rufo-testaceous, third segment of the abdomen fusco-testaceous; palpi pale testaceous in both sexes, mandibles testaceous with fuscous tips; head fuscous except the clypeus which is testaceous; antennæ fuscous, basally testaceous, elongate, 39–40-jointed in both sexes, longer than the body; meta-thorax shagreened: wings hyaline, stigma and nervures testaceous, the former with a darker spot of varying size. *Second abscissa of the radius as long as the first intercubital nervure*; legs testaceous, claws dark: abdominal segments one and two distinctly striolated, first segment scarcely narrowed from the apex to the tubercles; terebra almost as long as the abdomen.

Described from four males and two females.

A gregarious parasite, the cocoons being enclosed in a felt-like oblong ball which assumes the proportions of the pupal chamber of the host. Both males and females in the same brood. This species somewhat resembles *M. collaris*, but is most certainly not the *M. collaris* described by Marshall in Trans. Entom. Soc. 1888, p. 197, and Species des Hym. vol. 5, p. 238; it agrees more closely with Wesmael's description,† but as Marshall was acquainted with Wesmael's insects, no doubt he was right in the synonymy of his *M. collaris* with *Bracon collaris* of Wesmael; unfortunately, the latter's description lacks any mention of the length of the first abscissa of the radius or number of joints of the antennæ.

Among Fitch's insects is a card bearing six and a ball of cocoons to which is attached a label marked "G. C. Bignell,"

\* Mr. Harwood also considers this to be Marshall's writing.

† Nouv. Mém. Ac. Brux. 1835, p. 179.



beneath the card is the number 155. (Figs. 6 & 7.) As Bignell's collections and MSS. are now in the Municipal Museum, Plymouth, I wrote to the Curator, who very kindly supplied me with a copy of the following note which Bignell had placed against the number 155 in his diary: "*M. collaris*, bred from *Noctua triangulum*, July 19th, 1881 (80), from G. F. Mathew." No doubt these are the insects recorded by Bignell as *M. collaris* in his list of the Braconidæ of S. Devon,\* and by Fitch (Entom. xvi. p. 69).

It seems probable that Bignell, suspecting his specimens to be distinct from *M. collaris*, sent them to Fitch for advice, and that for some reason or other they were never returned.

In June, 1908, the larva of an Agrotid was brought to me, which immediately burrowed on being placed in a tin box with an inch or two of earth; this depth of soil was evidently insufficient, for a day or two afterwards I found that the caterpillar had come to the surface again, where it was lying in an apparently comatose state, and a large number of parasite larvæ were feeding upon it. These parasites were arranged in two irregular rows, one on either side of the unfortunate caterpillar. The host had already shrunk in size, and three days later had entirely disappeared, with the exception of the skin and the chitinous parts of the head. By this time the parasite larvæ, to the number of seventy or eighty, had more than doubled in size and commenced spinning an ochreous web round themselves, but being in an unnatural position were not successful in forming the usual ball. Probably owing to this many died, but a few succeeded in making their cocoons, and duly emerged. Unfortunately I have not these few specimens before me now, but I have little hesitation in referring them to this species.

I may mention that during the past few years I have reared a very considerable number of the larvæ of *Noctua triangulum*, but have not obtained this parasite.

The types are now in the collection of Mr. B. S. Harwood, of Colchester.

(To be continued.)

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## NOTES ON *PODAGRION PACHYMERUM*, A CHALCID PARASITE OF MANTIS EGGS.

By C. B. WILLIAMS, B.A., F.E.S.

ON May 17th, 1913, an ootheca of *Mantis religiosa* was kindly sent to me by Mr. Hugh Main from Lugano, Italy. Towards the end of May and the beginning of June a number

\* Trans. Dev. Ass. for Adv. Science, 1901, xxxiii. pp. 657-692.

of both sexes of a Chalcid parasite emerged by boring holes direct to the exterior.

These were identified by Dr. Perkins as a species of *Podagrion* (Chalcidoidea. Fam. Torymidæ). An examination of the collection of the British Museum showed the specimens to be identical with the type of Walker's *Priomerus pachymerum* (Ent. Mag. i. 1883, p. 118, figured in 'Entomologist,' i., 1840-42, plate F.). This is considered as the same as Westwood's *Palmon religiosus* (Trans. Ent. Soc. iv., 1847, p. 249, plate x., recorded from *Mantis religiosa*), but now belongs to the genus *Podagrion* (Spinola), and should therefore be known as *Podagrion pachymerum*.

The two genera *Podagrion* and *Pachytomus* (Walker) have, up to the present, been separated on the following characters:—

- a. Radius very short; tarsal joints 2-5 not short;  
8 teeth on the hind femora . . . . . *PODAGRION*.
- b. Radius longer; first tarsal joint long, the others  
shorter; 4 teeth on hind femora . . . . . *PACHYTOMUS*.

In the specimens which emerged as above, however, all the females had the characters given above for *Podagrion*, and the males those of *Pachytomus*. The latter genus has therefore been separated on purely sexual characters, and the single species, *P. klugianus*, is almost certainly a male of some species of *Podagrion*. The name *Pachytomus* must be considered as a synonym of *Podagrion*.

Fig. 1. shows the hind tarsi of both sexes, and also the arrangement of the teeth in the hind femora of the male and two forms found in the female. The number and arrangement of the teeth vary slightly, and the two forms figured for the female were the right and left femora of a single specimen. The relative lengths of the tarsal joints has been much used as a systematic character in the Chalcidæ, the above result, however, shows that some care is required in its application. Males of other species of the genus *Podagrion* do not necessarily differ from the female as in the above case.

The parasites were allowed to remain in the box with the ootheca from which they had emerged. No pairing was seen, but on June 2nd a female was observed ovipositing. The material of the ootheca was pierced quite easily by the long and slender ovipositor. The abdomen was first raised, then the ovipositor and its sheath were curled underneath till they touched the surface of the egg-mass at a point beneath the middle of the abdomen and, finally, the abdomen was slowly depressed, the stylets of the ovipositor entering the ootheca, while the double sheath bent out behind. A rough sketch of the female, with the ovipositor almost completely buried, is shown in Fig. 2. A pulsating movement was observed in the semi-transparent base of the abdomen when, presumably, the egg

was laid; the ovipositor was then partly withdrawn by raising the abdomen, then inserted fully again and another egg was laid. Several eggs were laid before the ovipositor was withdrawn completely. During this process the sheath was usually released, springing straight out behind, before the stylets were free.

It is hoped that the above will serve to correct a prevailing impression that *Podagrion* is unable to pierce with its ovipositor the hard mature ootheca of the Mantis. Xamheu (Bull. Soc. Ent. France, ser. 5, vol. vii. 1877, p. lxxix.) records finding two specimens of this parasite under the hind wings of a Mantis,

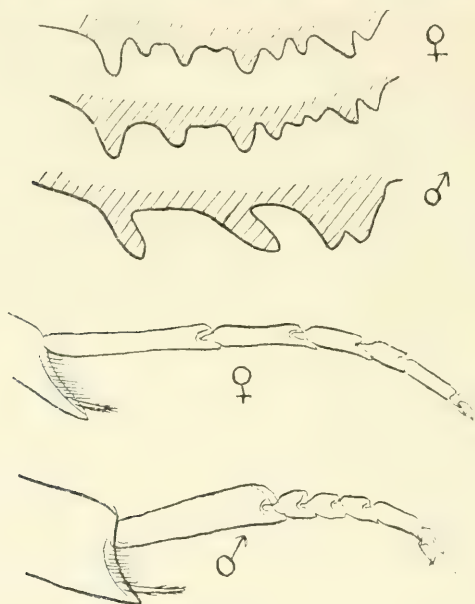


Fig. 1.

and assumed that they took up this position in order to lay their eggs in those of the Mantis during the construction of the ootheca. Giardina (Giorn. della Soc. di Sc. Nat. ed Econ. Palermo, xxii. 1899, p. 316) suggests that the female parasites cling to the edge of the wings of the Mantis by means of their toothed hind femora during the formation of the ootheca, and are thereby brought into a convenient position for attacking the Mantis eggs.\* Leigh (Trans. Manchester Ent. Soc. 1912, p. 30) also assumes that *Podagrion* is unable to pierce the

\* I hope at a later date to publish some observations on the construction of the ootheca, which do not support this author's views as to the use of the wings during the process.

mature ootheca. I am not in a position to confirm or contradict Xamheu's observations on the finding of the parasites under the Mantis wings (though there is some doubt as to the identity of his species; see Bull. Ent. Soc. France, ser. 5, vol. viii. 1878, p. clxiii.), but the explanations given are, at least, unnecessary and improbable.\*

Giardina (*l. c.* p. 317) also states that this parasite usually infests only one side of the ootheca, and that frequently the eggs on one side are all parasitized, while those on the other side were not attacked. In the specimens which I have examined there were individual parasites on both sides; sometimes only one or two in a compartment, but more usually all the eggs in one compartment were attacked. I can, however, confirm this author's interesting observation that the pupæ of the *Podagrion*

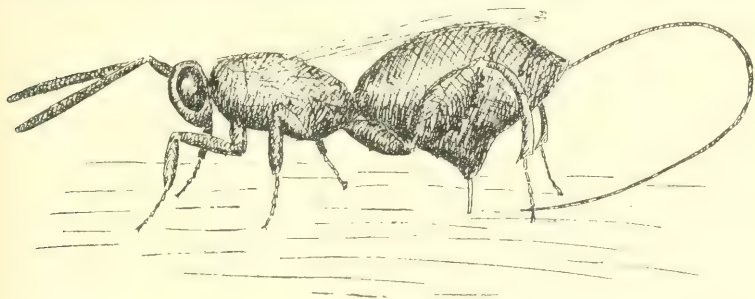


Fig. 2.—*Podagrion pachymerum* laying eggs in Mantis ootheca,  $\times 18$ .

in the Mantis eggs have their head directed to the tail end of the egg. It is possibly for this reason that they do not make use of the exit passages already prepared for the use of the young Mantids, but instead bore their way through the walls of the ootheca to the exterior.

On June 13th the Mantid larvæ began to hatch in numbers, all emerging in two or three days. Between July 13th and 20th about a dozen more *Podagrion* emerged, all of which were females. These would appear to be from eggs laid by the first brood six weeks before. The fact that they were all one sex may have been due to pairing not having taken place in captivity, and the eggs having developed parthenogenetically into females, as is the case with many other insects.

Specimens of *Podagrion pachymerum* were also bred by P. A. Buxton from ootheca of *Mantis religiosa* found in Algeria and

\* Since writing the above, I find that A. Girault has (*Ent. News*, Philadelphia, 1907, xviii., p. 107) described shortly the egg-laying of *Podagrion mantis*, a parasite of the American *Stagomantis carolina*. He also found that the parasite had no difficulty in piercing the ootheca with its ovipositor.



Tunis. From a much larger Mantis ootheca, name and locality at present unknown, I have bred four species of chalcids, three of which, possibly hyper-parasites, are very small and have no long ovipositor. The way in which these are able to get to the eggs in the middle of the ootheca is a problem well worth the attention of anyone who may have the opportunity of observing it.

The John Innes Horticultural Institution,  
Merton, Surrey: August, 1914.

## SOME NEW SPECIES OF LEPIDOPTERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### NOCTUIDÆ.

#### *Rivula pallida*, sp. n.

Head and palpi white-brown, the latter ochreous below; thorax white-brown mixed with darker brown. Fore wings white-brown powdered with darker brown chiefly on dorsal portion of basal two-thirds; antemedial line represented by three black dots—one on costa, one below cell, and one on the dorsum; postmedial line dusky, double, black dotted; reniform stigma faintly purplish, brownish outlined, enclosing two black dots; termen and fringes brownish; terminal dots black, the upper ones white-centred. Hind wings whitish, brownish-tinged towards margins. Under side of fore wings brownish with blackish spot at end of the cell representing the reniform stigma of upper side; hind wings white-brown, discoidal lunule dusky.

Expanse, 22 millim.

Collection number, 1367.

One male from Arizan (7350 ft.), August 6th, 1908.

Closely allied to *R. sericealis*, Schiff.

### NOTODONTIDÆ.

#### *Pydna virgata*, sp. n.

♂. Antennæ ciliated; head and thorax pale brown mixed with darker; abdomen pale brown marked with darker on the back of each segment. Fore wings pale brown longitudinally streaked with rufous brown, rather broadly below the cell and narrowly above the cell; the dorsum is clouded with darker brown; postmedial line represented by black points on the veins, almost parallel with the termen which is unusually oblique; terminal dots black. Hind wings dark brown, fringes pale brown. Under side pale brown, all wings suffused with fuscous on the disc.

Expanse, 50 millim.

A male specimen from Kanshirei.

The type of this species is in the British Museum Collection.

*Pydna sordida*, sp. n.

Antennæ fasciculate; head pale brown, crown darker; thorax pale brown mixed with darker; abdomen brown. Fore wings pale brown inclining to whitish on costal area; a longitudinal brownish streak from base passing through cell almost to termen, its outer extremity expanded and united with a brownish streak from apex of the wing; dorsum also brownish; postmedial line represented by a slightly curved series of black points on the nervules; a terminal series of black dots between the nervules. Hind wings pale brown, suffused with fuscous on the disc. Under side pale brown, rather silky.

Expanse, 46–50 millim.

Collection number, 1228A.

Two male specimens from Rantaizan, May 11th and 13th, 1909.

Allied to *P. pallida*, Butl.

*Pydna nebulosa*, sp. n.

Antennæ fasciculate; head and thorax whitish, the latter mixed with brownish in front; abdomen brown, edges of segments and the under side whitish. Fore wings whitish brown, suffused with ochreous brown and clouded with darker brown on the disc; subbasal and antemedial lines indicated by black dots; postmedial line represented by black dots on the veins, preceded by less distinct black dots between the veins; a brown dash from middle of the base of the wing extending to a black spot placed just beyond antemedial dots; three inwardly oblique brown streaks on terminal area, the upper one extending from apex of the wing to postmedial dots; a series of black dots on termen. Hind wings dark fuscous, costal area and fringes whitish brown. Under sides whitish brown, clouded with dark fuscous.

Expanse, 40–43 millim.

Collection number, 1229.

Two male specimens from Arizan (7300 ft.), August 10th and 15th, 1908.

Allied to *P. frugalis*, Leech.

*Pydna inconspicua*, sp. n.

Antennæ bipectinate; head, thorax, and abdomen whitish brown, the latter rather darker above. Fore wings whitish with faint ochreous tinge, dorsal area clouded with brownish and a longitudinal dash of the same colour below the cell; subbasal and antemedial lines indicated by black dots; postmedial line fuscous, wavy, dotted with black on the veins; black dots on the termen. Hind wings whitish with traces of a dusky postmedial line on dorsal area. Under side of fore wings fuscous, costa and fringes pale buff; hind wings whitish.

Expanse, 40 millim.

Collection number, 1228.

A male specimen from Arizan (7300 ft.), August 10th, 1908.

There is a male of this species, from Formosa, in the British Museum Collection. It is labelled "Kaegi Dist., 7-10,000 ft., July."

Allied to *P. straminea*, Moore.

#### CYMATOPHORIDÆ.

##### *Thyatira pennata*, sp. n.

♂. Head grey-brown, thorax blackish variegated with white; abdomen greyish white, tufts blackish. Fore wings grey-brown, clouded with white about middle of costal area and below apex; a black-edged whitish wing-shaped mark at base, a white sharply angled line from outer tip of the mark; a small upright black spot, inwardly edged with white, on dorsum below the mark; antemedial line black, sinuous; postmedial black, wavy, outwardly edged with white, almost parallel with termen, commencing in a blackish mark on the costa, indented at vein 2, whence a white streak runs to tornus; subterminal line white, wavy, commencing in whitish apical cloud, terminating at vein 2; orbicular and reniform stigmata whitish, outlined in blackish, reniform enclosing a grey-brown line; terminal lunules black outwardly edged with white; fringes grey-brown, pale at the base. Hind wings whitish, fuscous-tinged. Under side whitish tinged with fuscous; fore wings clouded with blackish and marked with white at the base and on the costa, postmedial line white only distinct on costal area.

Expanse, 37 millim.

Collection number, 928.

A male specimen from Arizan (7500 ft.), September 26th, 1906.

Comes near *T. opalescens*, Alph.

#### DREPANIDÆ.

##### *Albara griseotincta*, sp. n.

Head, thorax, and abdomen grey. Fore wings dark grey thickly powdered with pale violet grey, costa and fringes purplish brown mixed with ochreous; two dusky dots, set obliquely, at end of cell; postmedial line brown, oblique, united with the interrupted subterminal brown line below the apex. Hind wings agree with the fore wings in colour, medial line brown; fringes purplish brown mixed with ochreous. Under side grey, without markings.

Expanse, 32 millim.

Collection number, 1257.

A male specimen from Kanshirei, May 20th, 1908.

Comes near *A. opalescens*, Warr., but the tips of the fore wings are less produced, and there are no ochreous marks on the disc.

# AN EXPEDITION IN SEARCH OF RUSSIAN BUTTERFLIES.

By W. G. SHELDON, F.E.S.

(Continued from p. 242.)

THE season at Sarepta was about a fortnight later than the average, and this fact must be considered in connection with the dates given below.

I have to thank Mr. A. L. Rayward, who has most kindly made preparations of the genitalia of all species, the identity of which I was in doubt.

The number of species of Rhopalocera we saw in the Crimea was twenty-seven, at Novorossisk twenty-three, and at Sarepta seventy-six; and the total number in all three districts combined was eighty-six species, as follows:—

*Papilio podalirius*.—A rather small, weakly-marked race was not uncommon at Ialta and Novorossisk; and one or two examples, exceedingly worn, were seen at Sarepta during the first few days we were there.

*P. machaon*.—A few specimens were seen at all three localities, but it was only common at the tops of the mountains at Novorossisk; I saw, but did not capture, an example of ab. *aurantiaca* there.

*Parnassius mnemosyne*.—This species swarmed at Sarepta, in the "Tschapurnik Wald" on May 22nd, and later we found it almost equally abundant in the valleys towards Tsaritsyn. The form is a large one, with the black markings not so suffused, and bolder than is the case in specimens from the Alps. They are very like some I have from Herculesbad, except that the black spots are larger. Both these localities are at low levels, Sarepta being actually below sea-level, and Herculesbad only about 150 ft. above it.

*Aporia crataegi*.—Generally distributed in woods, but not abundant: the specimens are large and the veins very pronounced. The females, when newly emerged, have the yellow shading on the under side much stronger than in Central European examples. This species was first noticed on May 22nd.

*Pieris brassicae*.—Only seen at Sarepta; a few examples amongst gardens.

*P. rapae*.—Common at Ialta and Novorossisk.

*P. marni*.—Specimens of a Pierid which I feel sure is this species were taken at Sarepta.

*P. napi*.—I saw a few examples only of this species at Ialta and Sarepta. The only one I brought home is a very ordinary female from the first-named locality. In all probability our visit occurred between the period of the first and second broods.

*Pontia daplidice*.—Frequent at Novorossisk, and there was the tail end of a brood flying at Sarepta at the time of our arrival. These were var. *bellidice* of a very extreme form, with darker under sides to the hind wings than is the case in Southern French specimens, accounted for no doubt by the amount of cold the pupæ had



been subjected to. A second brood was abundant during the last few days of May; I should call these intermediate between the type and var. *bellidice*.

*Anthocharis belia*.—A very pretty form with light grey tips to the superiors was not infrequent at Ialta; the second brood became plentiful at Sarepta by June 7th; the upper sides of these are similar to South European var. *ausonia*, but the under sides are much darker, and closely resemble var. *simplonia*. I suppose they should be called var. *uralensis*, Bartel, but they do not seem quite to agree with his description of this variety.

*Euchloë cardamines*.—A remarkable race was abundant in the "Tschapurnik Wald" at the end of May; they are much larger than any I have seen from elsewhere, expanding up to 56 mm. The average expanse of British and European specimens I make to be about 42 mm., and Mr. Wheeler, in his 'Butterflies of Switzerland,' gives the same expanse. It will thus be seen how large this steppe form is. The discoidal spot on the superiors is smaller than in the type, and the under sides of the inferiors have very much less green. I propose for this local race the name of var. *volgensis*, n. var. Typical specimens were not infrequent at Ialta, and in the woods between there and Sebastopol; it was also seen at Novorossisk.

*Zegris eupheme*.—Not uncommon on the railway banks at Sarepta during the first day or two we were there; but, as happens in the case of the Spanish race, it disappeared all at once, and not a specimen was seen afterwards.

*Leptosia sinapis*.—Frequent at Ialta, also at Novorissisk, and one or two were seen in the "Tschapurnik Wald," at Sarepta. The examples I brought home are very typical first-brood forms.

*Colias hyale*.—Fairly numerous at Sebastopol; abundant at Novorissisk, and common at Sarepta at the date of our arrival, and a second brood was flying there in the middle of June.

*C. erate*.—This beautiful eastern species was abundant at Sarepta at the date of our arrival, and from its condition then it had evidently been flying some time. There was a series of emergences during the whole time of our sojourn, and it was particularly abundant during our last few days. The male is a particularly vigorous creature, flying at a tremendous pace, and very difficult to capture, unless one can intercept it in its course. The female is much less active, and frequently settles to suck at flowers. The white form of the female, var. *pallida*, was almost as abundant as the type. At Sarepta *C. erate* frequented chiefly the railway banks and cuttings, no doubt being influenced largely in its choice of locality by the luxuriant growth of leguminous plants on which the larva feeds, which are to be found there; the male was, however, to be seen at intervals, wildly scurrying along, all over the surrounding country. I was successful in breeding an imago from an ova obtained from a captive female.

*C. edusa*.—Common in the Crimea and at Novorossisk. At Sarepta I saw one or two worn examples on May 21st, and there was a second brood which I saw first on June 9th; these were not by any means abundant.

*Colias hybrids*.—It has long been noted that, when two or more of certain species of this group are found on common ground, inter-

mediate forms occur, and it is beyond reasonable doubt that these are hybrids. It is known that a number of Asiatic species produce these intermediate forms or natural hybrids; and there are certain species occurring in Europe which there is good reason to suppose hybridize also; for instance, in the only locality in which the two Arctic species *C. hecla* and *C. verdandi* are known to frequent the same ground, an intermediate form, ab. *christiienssoni*, Lampa, has been taken, apparently in numbers, judging from the series of it that we have in the National Collection. At Sarepta intermediate forms between *C. erate* and *C. hyale* and between *C. erate* and *C. edusa* are well known, and there are examples of both these forms in the National Collection. The first-named cross is known as *C. hyale* var. *sareptensis*, Stgr., and the second *C. erate* var. *chrysodona*, Boisd. Seitz has muddled the nomenclature of the former hybrid in his work; he first, in the description of the different forms of *C. hyale*, calls it var. *sareptensis*, and then, amongst the forms of *C. erate*, gives it the new name of var. *diana*. Obviously, hybrid forms between two species cannot have more than one name and, therefore, Staudinger's *hyale* var. *sareptensis* must stand. Seitz figures both hybrids. It seems probable that the vigorous male of *C. erate* is responsible for these abnormal pairings, which in the case of *erate*  $\times$  *hyale* produced offspring at Sarepta more numerous than the typical *C. hyale*. The hybrid *erate*  $\times$  *edusa* was not abundant; I only saw some half dozen of it in all: these were very constant and without variation; but of the *erate*  $\times$  *hyale* hybrid there is every form, from almost typical *C. erate* to almost typical *C. hyale*. One wonders if these hybrids are not fertile *inter se*, or with one or both of the parent species. One possible reason why the *Colias* species hybridize freely is that the genitalia of many of them are so similar there seems no physical obstacle to their doing so. The similarity in these organs prevents them being used as factors to identify the various hybrids.

*Gonepteryx rhamni*.—Hibernated specimens were seen at Ialta and Sarepta, and in the latter locality freshly emerged examples were frequent from June 16th; they are rather smaller than those I have from Britain and Central Europe; the males are a little more richly yellow, and the females rather whiter.

*Thecla w-album*.—Common in clearings in the "Tschapurnik Wald" from June 16th; they were very partial to the flowers of *Gypsophila paniculata* and other plants.

*T. ilicis*.—In the same locality as the last, apparently not abundant; the only example I brought away is a typical female. First seen on June 16th.

*T. spini*.—Abundant and generally distributed from June 12th onwards; they were the type form without any approach to ab. *lynceus*.

*T. pruni*.—I saw three or four fresh specimens in the "Tschapurnik Wald" on May 22nd, flying over blackthorn bushes, but did not come across it afterwards; the only one captured, a male, does not differ from those I have from Central Europe.

*T. acaciae*.—First seen on June 4th; not uncommon, and generally distributed amongst blackthorn. The only difference I can

see in the Russian specimens from those I have from Hungary is, that on the under sides of the former the ground colour is grey, and of the latter grey-brown.

*Callophrys rubi*.—The most remarkable race of this species that I have seen was common at Novorossisk. It is a small form with an average wing expanse of 30 mm.; the under side is typical, but the upper sides of the wings in both sexes are black, without the slightest tinge of brown, and the whole surface has a grey-blue sheen, similar to that which is found in male examples of *Zephyrus quercus*, but of course the sheen is not the same colour as in that species. I propose for this remarkable race, which so far as I am aware is confined to the Caucasus, the name of var. *schamyl* n. var. I saw, but did not capture, a few examples of *C. rubi* at Ialta; these, as far as I could see, were very typical. A few examples were seen at Sarepta on the outskirts of the "Tschapurnik Wald"; they are rather darker brown in colour than the type, and have an expanse of about 34 mm.

*Chrysophanus phlaeas*.—A few very typical cold-form examples were seen at Ialta and Novorossisk.

*C. dorilis*.—A very typical male was taken by me at Sarepta on May 22nd.

*C. thersamon*.—Abundant at Sarepta, but somewhat local, chiefly frequenting the railway banks and the adjacent slopes; a bright form, especially on the under side, on which the grey ground colour of the hind wings is much lighter, and the copper ground of the fore wings much brighter than in Hungarian examples. I suppose they would all come under Klug's var. *omphale*, but it is difficult to know where the type ends and this variety commences. The chief distinction that Klug makes is that his var. *omphale* has tails on the inferiors; and he figures the males and females with tails approximately 2 mm. and 4 mm. long, respectively; but all *C. thersamon* that I have seen have tails in both sexes, if only rudimentary ones. My Sarepta specimens have tails, in the males about three quarters of a millimetre in length, and in the females 2 mm. in length, whereas Hungarian first brood examples, which I understand to be the type, have only very rudimentary tails, of not more than a quarter of a millimetre in length. Individuals were continually emerging at Sarepta during the whole period of our stay.

*C. dispar* var. *rutilus*.—I was much delighted to see this grand species once more. Years ago I formed the opinion that it was the most beautiful European butterfly when seen on the wing; and now that I have observed all the European species, with the exception of about sixty, I can fully confirm this opinion. One can imagine what our British type, the finest form of all, must have looked like. I first saw var. *rutilus* at Sarepta in a small swamp in the railway cutting, a mile or so to the south-east of the town, on May 26th. Afterwards we found that it was generally distributed in the small swamps that are to be found in certain valleys which lie towards Tsaritsyn; it was not very common there, but I expect it was abundant in the large marshes between the arms of the Volga, had one cared to work them, which I did not. The form is a very similar one to that found near Budapest, and quite as large.



*Everes alcetas*.—A large form of this species, expanding about 33 mm., was not uncommon on the outskirts of the "Tschapurnik Wald," and also on the railway banks, from May 20th.

*Scolitantides baton*.—Common at Ialta, less so at Novorossisk, and widely distributed at Sarepta: in all cases the examples are the type form, without any approach to var. *panoptes*.

*S. pylaon*.—This Eastern species was fairly common on the banks and in the cuttings of the railway, but at first I experienced considerable difficulty in distinguishing it, especially on the wing, from the much more abundant *Plebeius argyrognomon*, with which it flew. It had probably been out a week or ten days before we arrived at Sarepta; after the first two days it got rare, and the examples seen were all more or less defective, although odd ones were picked up whenever we collected in its localities until May 27th. In the series I obtained there is not any noticeable variation in the females, but there is a good deal in the males. *S. pylaon* was first described by Fischer de Waldheim (the female only). Herrich-Schäffer, who next dealt with it in 'Schmetterlinge von Europa,' figures both sexes; of the male, fig. 333 illustrates a form without black spots on the hind margins of the inferiors, upper side, but with two red lunules at the anal angle of each; this form, therefore, which was not uncommon at Sarepta, it would appear, in accordance with the law of priority, is the type. The other forms obtained include one figured by Herrich-Schäffer (fig. 339), which shows a row of black spots on the upper side of the inferiors on the outer margin; this form I propose to call ab. *nigro-puncta*, n. ab. The other form I obtained is entirely without black spots or red lunules on the upper side of the inferiors, for this I propose the name of ab. *immaculata*, n. ab.

*Plebeius argyrognomon*.—Abundant at Sarepta and in good condition at the date of our arrival. An interesting form; the males of a deeper blue than the Western specimens which I possess; both sexes have the orange bands on the under side very prominent, in this respect resembling the Hungarian form; the species continued in good condition for several days.

*P. argus (ægon)*.—The most abundant *Lycænid* seen at Sarepta—swarming everywhere. The first examples which were flying at the date of our arrival were small and dull-coloured, but those that emerged in June were much larger, with whiter under sides.

*Polyommatus astrarche*.—Only seen at Novorossisk where I captured a few very typical specimens of the southern low level race.

*P. icarus*.—Common everywhere we collected, especially at Sarepta. A large form; the females entirely without blue on the upper side. I kept a very careful look-out for *P. thersites*, without success, and I am convinced that this recently recognised species does not occur in any locality in which we collected, although its food-plant, sainfoin, grows freely at Sarepta.

*P. eroides*.—One example, a very fresh male of this beautiful species, or form of *P. eros*, was taken by me on June 12th at the top of a cross valley in the hills which are opposite to Sarepta. It was a very windy day, and I feel sure that the butterfly had been blown



from its true locality, but a long and wide search for further specimens was fruitless.

*P. bellargus*.—Only seen at Ialta; the males which were just coming out were large examples of *ab. puncta*.

*P. amandus* var. *lydia*.—This form of *P. amandus* was not uncommon on bushy slopes, both at the "Tschapurnik Wald" and in the valleys in the direction of Tsaritsyn. The first specimens were seen on May 23rd, and the species continued in good condition for about a month, after which it became worn.

*Cupido sebrus*.—A short series was taken at an altitude of about 1000 ft. at Ialta, where the species frequented flowery clearings in the pine-covered slopes of the mountains. The males are of a deeper and purer blue than the type; the females are remarkable in that nearly the whole of the superiors and the bases of the inferiors are suffused with grey-blue scales. I propose for this form the name of *ab. caerulea-grisea* n. ab.

*Glaucopsyche caelestina*.—This Eastern species had evidently been common a short time previous to our arrival at Sarepta; but the examples we took were almost all worn to shreds, and it took my best efforts to obtain half-a-dozen fair specimens, which were picked up singly wherever there was a considerable growth of leguminous plants.

(To be continued.)

## A FORTNIGHT IN SHETLAND.

By PERCY C. REID.

AT 9 a.m. on July 14th, my friends Messrs. J. Peed and G. D. Hancock and myself left Aberdeen on the s.s. 'St. Sunniva,' bound for Baltasound in the Island of Unst. After a calm passage we found ourselves when we awoke next morning at Lerwick, where we changed on to the s.s. 'Zetland,' and reached Baltasound that night at 10 p.m., some three hours behind time, owing to fog. We had engaged rooms at the Queen's Hotel, which lies about a mile from the landing stage, so that it was not far from midnight before we had had some supper and were settled in. The next day was spent in surveying the country and deciding on our plans.

The Island of Unst lies practically due north and south, and is some twelve miles long by about five miles wide, with Baltasound at the head of a deep inlet just about halfway up the east coast. The island is composed of round-topped hills, covered with grass and short heather, with the highest hills, Saxaford and Hermaness, at the northern end, and is traversed longitudinally by a deep depression, which from the latitude of Baltasound is occupied northwards, first by Loch of Cliffe, a fresh-water loch, and then, separated from it only by a sand bar, by a sea loch called Burrafirth.

Our main object was of course the capture of *Crymodes exulis*, and for this we were told the high ground between Loch of Cliffe and the western coast was the best locality.

There is not a tree nor even a bush on the island except a few planted in gardens, so we were fortunate in finding several wire fences with wooden posts, which ran east and west right across the *exulis* ground. Two of these fences were about on a level with Baltasound, near the head of Loch of Cliffe, while two more were at the far end of that loch. The former were within a mile or so of the hotel—to get to the latter necessitated a bicycle ride of at least five miles, as a long detour *viâ* Haroldswick had to be made. Eventually we fixed on the most northerly fence of all, which started from where the lighthouse keepers lived, at a place called Fiskna Wick on the west side of Burrafirth, and to this fence we practically confined our sugaring work.

Night after night we visited it, with more or less success, but with never a blank, and in the end found we all three had a full complement of *C. exulis*, with some to spare for our friends. Although on the whole in excellent condition, we took several, even on the first night, which were somewhat torn and chipped, and no doubt we might have done even better had we been a week earlier.

From the same fence we took plenty of *Mamestra furva*, *Agrotis porphyrea* (dark), and swarms of *Noctua festiva* var. *conflua* [*thulei*, Staud.] in endless variety. One or two *H. adusta*, one *Eurois occulta*, one *Phlogophora meticulosa*, one *Dianthæcia conspersa*, and several *Triphena pronuba* completed the bag at sugar. But *M. montanata* and *L. cæsiata* (both in the Shetland form) were common all over the hills. At the date of our arrival there was practically no real night, and indeed it was not dusk enough till about 10.45 p.m. to be worth going round the sugar. But this state of things soon altered, and during our fortnight's stay the days had drawn in by certainly half an hour. Just as a week earlier would perhaps have been better for *C. exulis*, so it would certainly have suited better for *Hepialus humuli*, *Dianthæcia conspersa*, *Emmelesia albulata* and *Coremia munitata*. Of *H. humuli* I saw but three, all females, which were on the wing at 10 p.m. on July 19th, close to Haroldswick. Of *D. conspersa* I took only one worn specimen on the same evening, but by searching *Silene maritima* persistently we were able to make a fair bag of larvæ, which were still very small.

*Silene maritima* occurs sparsely round Baltasound inlet and at a few other spots, but at Haroldswick, chiefly on the south side and at the head of the bay, it grows in immense profusion. Here we found the larvæ of *Eupithecia venosata* in swarms—indeed, so plentiful were they that often every seed-head of the *Silene* was cleared out, and it looked as if the larvæ of *D. conspersa* would

be hard put to it to find food when they became larger. The *E. venosata* larvæ had nearly all pupated by August 1st, and the *D. conspersa* larvæ pupated after my arrival home, about August 25th.

I only saw one specimen of *H. relleda*, although it is said sometimes to be very common. As there is practically no brake fern, so far as I could see, it is evident that in Unst the larvæ must use some other food—probably dock, which is very common round the walled-in fields.

*Coremia munitata* we found in fair numbers only. As always with this insect the females were hard to find, and all I secured were taken at rest on rushes which grew in the sand between Loch of Cliffe and Burrafirth. Males, however, I took not uncommonly at Haroldswick and in the marshy meadows that line the burn which flows into the top end of Loch of Cliffe. *E. albulata* occurred almost everywhere with its food-plant. Both it and *C. munitata* were, of course, of the Shetland form, and very different from those found further south.

We had intended to stay in Shetland for a month, but unfortunately the outbreak of the war robbed us of half our stay. When we left, *Charæas graminis* was just beginning to come out, but it was still too early for *Noctua glareosa* or *Celena haworthii*, both of which insects we wanted.

The worst of Shetland is the long journey there. Once arrived, the Queen's Hotel affords very good accommodation, the insects are most interesting—with hard work a good bag is practically a certainty—while to anyone fond of ornithology, the wealth of bird life is something entrancing. Even now I can hear in fancy the wild cry of the Richardson's Skuas, and of the Great Skuas who were our nightly companions on our sugaring rounds.

Feeringbury, Kelvedon: September 13th, 1914.

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## NOTES AND OBSERVATIONS.

ABUNDANCE OF CYANIRIS ARGIOLUS IN SOUTH-EAST SUSSEX.—I was staying in Winchelsea during the latter part of August and the first part of September, and during my walks in the neighbourhood I noticed that larvæ of *Cyaniris argiolus* were especially abundant. There is much ivy in the hedges along most of the roads there, and the blossoms are particularly luxuriant this year; and scarcely a patch of any size could be found which did not contain many larvæ. *Pyrameis atalanta* was also present in considerable numbers, and in places *P. cardui* was to be found; but I did not see a single specimen of *Vanessa io*, and very few *V. urticae*. It is also worth recording that, during the whole five weeks of my stay, there was only one wet day.—F. A. OLDAKER; The Red House, Haslemere, September 15th, 1914.

VARIETY OF *CHRYSOPHANUS PHLEAS* NEAR ASHBY-DE-LA-ZOUCH.—A friend has just brought to me a recently caught specimen of *C. phleas schmidtii*. It is the first I have seen taken in this district, where *C. phleas* is somewhat common. Both hind wings are slightly damaged, otherwise it is in good condition—pearly white, as distinct from the cream-tinted variety.—FRANK BROWN; Bath Street, Ashby-de-la-Zouch, September 17th, 1914.

GYNANDROUS *P. ICARUS*.—Whilst on the look-out for female vars. of *P. icarus* here on the 4th inst., I took a fine example of the gynandrous form, in which the left pair of wings are male and the other pair female. The latter have only a few blue scales, although at this spot most females are of the lovely ab. *cærulea* form. Excepting the upper male wing, the under sides have the usual female coloration.—MARTIN J. HARDING; Oakdene, Church Stretton, September 21st, 1914.

LEUCANIA FAVICOLOR IN HANTS.—I should like to record the capture at sugar on our local marram-grass, of three specimens of *L. favicolor*—two on June 29th (one fair and one good), and one on July 4th (poor).—A. L. BURRAS; 3, Connaught Road, North End, Portsmouth.

CERURA BIFIDA IN AUGUST.—A larva of *C. bifida* pupated July 17th, 1914, and the moth emerged to-day, August 13th.—H. C. JEDDERE-FISHER; Apsleytown, East Grinstead.

NOTE ON *HECATERA DYSODEA*.—I shall be glad if any of your readers will say if they ever come across *H. dysodea* now. A few years ago the larvæ were to be found regularly every year about here, in greater or lesser numbers. But since, I think, the year 1905 I have never been able to find a larva, and I believe the same thing has been noticed at Wicken, where also they used to be common. Has this insect unaccountably become extinct?—PERCY C. REID; Feeringbury, Kelvedon, September 10th, 1914.

EUVANESSA ANTIOPA IN NORFOLK.—I think it will interest you to know that on Tuesday morning last my little girl of six years captured a specimen of *E. antiopa* in Gaywood. She has a net, but on that occasion she did not have it, so she got a big-necked bottle from a friend's house and put it over the butterfly which was sitting upon some wood. I am afraid it got a bit mauled, because she transferred it to other receptacles once or twice; but Mr. Atmore, to whom I showed it, says it is a fine big specimen.—C. G. BARRETT; Pleasant House, Gaywood, near King's Lynn, September 17th, 1914.

LARVÆ OF *ACHERONTIA ATROPOS* NEAR NORWICH.—During the last two weeks of August larvæ of *Acherontia atropos* have been found, not infrequently, in this district; and I have heard of at least three other specimens from the neighbourhood of Wymondham, which brings the number I have come across up to ten examples. They were apparently all found on rather large fields of potatoes, and I have heard of none from small patches of the food-plant. The Norfolk yokel is usually terrified of anything out of the ordinary, and immediately destroys it, and one larva was cut in half by the



spade of the man who found it. Those I saw were all full fed or nearly so. One was found walking across a large tennis lawn. I have seen no *Colias edusa* here this year, but during the hot days a fortnight ago *Pyronota cardui* was rather in evidence in the clover fields and also in gardens, where it was attracted by standard heliotropes; all those I saw appeared to be rather worn. *P. atalanta* has been unusually abundant, and is still (September 23rd) in beautiful condition; it is always a common species in gardens here during the first weeks of September, and is also often plentiful nearer the coast. Last week we had three or four extremely cold days, and I found many torpid *Atalanta* sitting on the dahlia flowers, always choosing the red, or red and orange blossoms. Perfectly fresh *Polygonomatus icarus* were seen when out partridge driving on the 19th.—GERARD H. GURNEY; Keswick Hall, Norwich.

DRAGONFLIES BRED IN 1914.—This year I have bred *Brachytron pratense* (one female) from a nymph found early in June, 1913, in the Ouse, near St. Ives, Huntingdon. The dragonfly emerged on (or about) May 12th. *Æschna grandis*, from nymphs taken in the canal at Byfleet last year, and from one taken in the canal, near Purton, Wiltshire, early this summer; *Libellula quadrimaculata*, from nymph taken at Byfleet this summer; *Sympetrum striolatum*, from nymphs taken in canal near Purton; *Calopteryx virgo* (Overwater stream, New Forest); *Lestes sponsa*, male (Byfleet Canal); *Enallagma cyathigerum*; *Agrion puella*; *Pyrrosoma nymphula*. I found imagines of *P. nymphula* in one of my aquaria (they are fitted with a kind of gauze case) on my return to town after a week-end away in the last week of April. They were not from nymphs collected this year, for at that time I had not yet been out for nymphs this season, and I was not aware that I had put any *P. nymphula* in that aquarium last year. But I had put in a good many Zygopterid nymphs (mainly *Erythromma najas* and *Ischnura elegans*) in early summer, 1913. Some of them must have been only partly grown *P. nymphula*; I have found the same thing happen before with this species, but with no other Zygopterid; the nymphs of every other Zygopterid dragonfly I have ever taken have always emerged in the year in which they were taken (in May or June). Only *P. nymphula* have remained in the nymph stage over the following winter. None of the nymphs could have been hatched in the year that I took them (mostly in May); for that year's nymphs would either not have been hatched at all by then or would be very small. They must presumably all have been already nearly a year in the nymph stage; when taken, so that the *P. nymphula* that came out in the summer *after* must have been about two years in that stage. There seems to be great uncertainty as to the average duration of that phase of a dragonfly's life. With *Cordulegaster annulatus* it is a long stage; I doubt if it is ever less than two years. I have a nymph of that species now, taken in May last. The egg can hardly have been laid later than August, 1913; and the imago will not emerge until June, 1915. This would be a little under two years. But from the size of the nymph when taken, it may well have been hatched early in July, 1913, and even not in 1913 at all, but in 1912. I should like to ask if others have found *Calopteryx virgo* as difficult

to breed as I have. The nymphs mostly thrive until the time comes for emergence, then, after several days' waiting for the great event, they disappear. They die, of course, but I can seldom, in fact hardly ever, find the dead bodies. Do they descend into the mud bottom and die there? I have got a few of these most beautiful of all British insects to come out; but only a very small percentage of the nymphs I have taken. So much so that I begin to doubt whether it is justifiable to take the nymphs. It seems idle to take them if they are only going to die in the nymph stage. One point occurs. I have taken these nymphs only in running water. Is it possible that they can live but with difficulty in still water?—HAROLD HODGE; 9, Highbury Place, London, N., August 16th, 1914.

## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 23rd.*—The President in the chair.—Mr. Newman exhibited larvæ of *Celerio gallii* reared from ova, and a larva of *Jocheæra alni*.—Mr. West, a weevil found in papers from South Africa.—Mr. Curwen, a dwarf *Polyommatus icarus* measuring 20 mm. in expanse, from Piggott's Hole.—Mr. Morford, a bred series of *Syntomis phegea* from ova laid by a female taken at Iselle.—Mr. Main, small Psychid larvæ, in their little cases, which had emerged from a large case (cocoon) from Lugano, with some larvæ of the fire-fly *Luciola italica*.—Mr. Blair, bred specimens of the beetles *Crioceris lili* (*merdigera*, F.) and of *C. merdigera* (*brunnea*, F.), the larvæ of the former on lilies, of the latter on black bryony.—Mr. Priske, living larvæ and pupæ of the beetle *Melasoma populi*.—Mr. Morford, the large Saturniids *Philosamia cynthia* and *Antheræa perneyi*.—Mr. Step, on behalf of Mr. West (Greenwich), a large mass of aberrant growth of twigs of willow, apparently caused by a species of gall.

*August 13th.*—The President in the chair.—Mr. Edwards, the large Saturniids *Antheræa paphia*, *Automeris illustris*, *Citheronia magnifica*, *Samia angulifera*, *S. promethea*, the Sphingids *Oryambulyx substrigilis* and *Psilogramma menephron*, and *Eribomorpha fulgurita*.—Mr. Newman, the pink form of *Neuria reticulata* from the coast of County Cork, and two forms of the pupa of *Selenia lunaria*, the chocolate-coloured hibernating one and the bright green second brood one.—Mr. A. E. Gibbs, a large Psychid larva, which fed on sea grape and sweet lemon.—Mr. Curwen, fine series of *Apatura iris*, *A. ilia* with ab. *clytie*, ab. *iliades*, ab. *pallescens*, &c., from Samoussy, near Laon.—Mr. C. B. Williams, living larvæ of *Saturnia pyri* from Syria, and reported finding a mite, *Eriophyes*, in the willow galls exhibited at the last meeting.—Mr. Main, a living pupa of *S. pyri* from Lugano, and eggs of *Ascalaphus* from South France.—Mr. Dennis, *Centaurea solstitialis*, a rare alien plant from Cobham, Kent.—Dr. Chapman, the cases of a Psychid, *Oreopsyche pyrenella*, from Gavarnie, Pyrenees, and gave notes on the life-history of the species. The male moults twice at pupation, the female only once.

*August 27th.*—Mr. A. E. Gibbs, Vice-President, in the chair.—Mr. F. W. Hall, aberrations of *Polyommatus icarus* from Hertford

and Folkestone, including radiated under side, dwarf, brilliant blue female, bleached male, &c., specimens.—Dr. Chapman, imagines and parasites of *Oreopsyche pyrenella*, with examples of the larval skins moulted at pupation.—Mr. Main, insects found in baskets of cane sugar from Java, including Coleoptera, Blattidae, a cricket, &c.—Mr. Neave, blue female aberrations of *Polyommatus icarus* from Otford first brood, and Chipstead second brood.—Mr. Edwards, examples of the genera of Rhopalocera, *Delias*, *Metaporia*, and *Dismorphia*.—A discussion took place as to the habit of some species of Lepidoptera to return again and again to the same spot, *Mania maura*, *Gonepteryx rhamni*, *Amphipyra pyramidea*, &c., being instanced.—HY. J. TURNER, *Hon. Report. Sec.*

## RECENT LITERATURE.

*Memorias do Instituto Oswaldo Cruz.* Vol. v. and vol. vi., pt. i. Rio de Janeiro-Manguinhos. 1913, 1914.

The following are titles of some of the papers in volume v.:—

Sobre o ciclo evolutivo de *Schizocystis spinigeri*, n. sp. Gregarina do intestino de uma especie de Spiniger, por Astrogildo Machado. (Pp. 1-15; plates 1-3.)

Notas sobre um caso de Milase humana ocasionada por larvas de *Sarcophaga pyophila*, n. sp., pelo Drs. Arthur Neiva e Gomes de Faria. (Pp. 16-23.)

Informações sobre a biologia da Vinchuca, *Triatoma infestans*, Klug, pelo Dr. Arthur Neira. (Pp. 24-31.)

Citologia ciclo evolutivo da Chagasella alydi. Novo coccidio pasazado dum hemiptero do genero "Alydus," pelo Dr. Astrogildo Machado. (Pp. 32-44; plates 4, 5.)

Contribuição para o estudo das Ceratopogoninas hematofagas do Brasil, pelo Dr. Adolpho Lutz, Parte Sistemática. Segunda Memoria. (Pp. 45-73; plates 6-8.)

Notas hemipterologicas, pelo Dr. A. Neiva. (Pp. 74-77.)

Contribuição para a biologia das megarinias com descrições de duas especies novas, pelo Drs. Adolpho Lutz e Arthur Neiva. (Pp. 129-141.)

Tabanidas do Brazil e de alguns Estados visinhos, pelo Dr. Adolpho Lutz. (Pp. 142-191; plates 12, 13.)

Titles of papers in vol. vi., part i. (1914):—

Contribuição para o estudo da biologia dos Culicideos. Observações sobre a respiração nas larvas, pelo Dr. A. da Costa Lima. (Pp. 18-34; plate 4.)

Contribuição para o estudo dos redúvidas hematofagos, pelo Dr. Arthur Neiva. 1. Notas sobre os redúvidas hematofagos da Bahia com a descrição da nova especie. (Pp. 35-39.)

Notas dipterologicas, pelo Dr. Adolpho Lutz. Contribuição para o conhecimento dos primeiros estados de tabanideos brasileiros. (Pp. 43-49.)

1. Contribuição para o estudo das Megarhininae. 11. Do *Megarhinus haemorrhoidalis*, Fabricius, 1794 (Pp. 50-57; plates 5, 6.)



# THE ENTOMOLOGIST

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## THREE WEEKS IN DAUPHINY.

By H. ROWLAND-BROWN, M.A., F.E.S.

### (i.) *La Grave.*

WHEN I left London on a blazing July day, the promise of a successful entomological tour in the mountains south of Grenoble seemed assured. Letters from French correspondents beginning in the spring had prepared me for a great butterfly year: an absence of late frosts, prevalence of sunny skies, and only just the requisite rainfall to encourage the crops from north to south. The factors of success were established—at least, I thought so; and when I stepped into the P. L. M. motor outside Grenoble station on the morning of the 11th, there was not a cloud even the size of a man's hand in the sky of the Midi or on the visible political horizon. In April, when I had had the privilege of addressing the Entomological Society of France at their annual banquet, and at a moment when Paris was celebrating the visit of our King and Queen, I ventured to suggest, "heureusement pour nous autres, les chevaliers de la Nature, la politique n'existe pas." I little thought how soon and in how sudden fashion the welter of European politics was to engulf the comity of nations, and how the waves of a great war were to sweep over the quiet haunts where in former years I had wandered in search of butterflies. To-day, after three months of storm and stress, the calm Alpine valleys, thick with corn; the mountain pastures, a wonder of flowers; the restful villages—all are as a dream to the reality of which the little harvest of my cabinets alone may testify.

This part of the Dauphiny Alps has been worked for many years by English lepidopterists; less systematically by the French, though, needless to say, the indefatigable M. Charles Oberthür has taken toll of the district; while it was one of Dr. Reverdin's observations (*in litt.*) on the occurrence of *Erebia scipio* at Monétier-les-Bains, on the southern side of the Col de Lauteret, which tempted me to include a week there in my programme. In the 'Entomologist's Record' (vol. viii. 1896; ix. 1897) the late Mr. Tutt gives an exhaustive account of a visit to Le Lauteret and La Grave during the first weeks of August.



To later volumes the Rev. F. E. Lowe (*loc. cit.* xxii. 1910), Mr. A. S. Tetley, and Mr. Douglas Pearson contribute their experiences of that charming country. For this paper, therefore, my only excuse is that hitherto nothing has been written on the subject in the 'Entomologist,' and that I visited one locality at least to which most of these authorities paid but slight attention. To Dr. Chapman's suggestive note on the local "grass" *Erebia*s (Proc. Ent. Soc. 1913, cvii.-cx.) I shall refer later on.

There are two hotels at La Grave equally comfortable and well kept—the Hotel des Alpes and the Hotel de la Meije. I stayed at the former for ten days. And here I should like to point out how helpful it is when lepidopterists, who have visited foreign localities and write about them, give others following their footsteps the benefit of their hotel experience. Personally, I find the Touring Club of France guide invaluable for the purpose of selection. May the next issue reintroduce us to the hospitality of Alsace and Lorraine!

Arriving in time for a late *déjeuner* after a drive of surpassing loveliness, I spent the afternoon prospecting in the deep meadows that lead up to the Meije glacier. Facing the Meije, La Grave stands boldly up from the torrent of the Romanche. Across the mule-path leading on this side to the river a muddy trickle attracts the "Whites" and "Blues" in cheerful abundance; *Aporia crataegi*, fresh males, but small; *Parnassius apollo*; on the yellow crucifers *Anthocharis simplonia*, at this level (5000 ft.) already rather worn; and among smaller fry, *Plebeius argus* (*ægon*), *Polyommatus hylas*, and *Nomiades semiargus*. I did not observe *Papilio podalirius*, but it was not uncommon lower down towards Bourg d'Oisans. *P. machaon* occurred singly in the village itself. But undoubtedly the best collecting ground hereabouts is on the left bank of the river, and up to the Meije glacier. The first four days of unclouded sunshine, from the 12th to the 15th, were fully occupied. In the lower pastures *Erebia pharte* males were flying in profusion, the females as yet hardly emerged; *E. epiphron* var. *cassiope*, decidedly rare; *E. ceto*, a dwarf race compared with that of the Swiss Alps, less so; and, of course, *E. stygne*; though by far the commonest of the genus was *E. euryale*, constant and typical in form, and often assembling by the score at the runnels, or starting up from every branch and flower in the fir woods.

Pushing on to the moraine of the Meije glacier, I had not been long on the look-out when the first glossy *E. alecto* flew across the path, and later I was fortunate to bag one or two perfectly fresh females. One such rose from my feet as I was struggling with the loose shifting scree. She had evidently been disturbed in the act of oviposition; and, as the only plant at this particular spot was a sort of tuft grass, I have not much doubt that this plant—afterwards identified in the Alpine garden

at Le Lauteret as *Festuca pumilosa*—is the pabulum of the species. This same female obliged with several eggs in the pill-box to which she was consigned—a rather unusual occurrence in my experience of this butterfly, and of the whole *Erebias*, though I have known single eggs expressed from the body in the killing-bottle. As at Larche, the La Grave *alecto* are without exception of the form which M. Oberthür has named *duponcheli*, and hardly to be distinguished from the familiar var. et ab. *pluto* of the Central Alps. I am sure this insect is possessed of abnormal hearing power; when approaching, the displacement of the smallest stone causes it to get up. Its method of flight is also peculiar. I watched many males in their apparently aimless and inconsequent zigzag flight over the moraine—like that of *Orgyia antiqua* in a London square—suddenly flopping on a stone, very seldom on a flower, and immediately orienting to the sun with wide outspread wings. The females do not indulge in these eccentricities. They keep low above the surface when on the wing, and are naturally sluggish and slower than the males. When the sun is overcast both sexes at once slip for shelter under a stone, or into the crevices of rock, and neither, as with some other *Erebias*, can be got to move when the sky is cloudy.

It is perhaps worth remark also that, if the tendency of the grass *Erebias* is towards diminutive size at La Grave and Le Lauteret, the ubiquitous *stygne* is rather larger than otherwise. Where they present local variation, I make a point each year of netting a few, but the aberration captured in the gorge below the vacherie on the Meije path, about an hour's easy walking from the village, came as a great surprise, and is the most remarkable form of this common butterfly I have ever encountered. It is an absolutely fresh male. The bands on both wings appear to be better developed than usual, but this, I think, is more apparent than real, and due to the entire absence of the black spots in which ordinarily the white pupils are set. The pupils themselves are reduced to mere metallic pin-points. Unless already distinguished with a name, I propose to call it *abannulata*, new ab., and it would be interesting to hear whether any of the many lepidopterists who have collected *E. stygne* in France or elsewhere have met with a similar form. Favre's ab. *aboculata* female is described by Mr. Wheeler ('Butterflies of Switzerland,' p. 132) as "without spots fore wing, upper and under side; hind wing, with two black dots in place of eye-spots." In M. Oberthür's figures of his var. *gavarnica*, male ('Lépid. Comparée,' plate xxv., fasc. iii.), the rusty bands on the upper side of the fore wings are much narrower than in the type, the pupilled spots tiny (under side one small apical spot only), and much closer to the outer margin; the female showing the same peculiarities.

And here I should like to draw attention to some further remarks by M. Oberthür on the variation of a form of *E. stygne* from Switzerland. Describing an aberrant male taken by the late M. Wullschlegel, near Martigny, he speaks of it as "larger and much darker than the norm; the wings suggest the deep black with the beautiful reflections of *E. lefebrei*; on the upper side of the fore wings are five black ocellated spots, pupilled white, and in the same way on the hind wings. Rusty band reduced to several feeble blotches on the internal side of the ocellations and on the fore wings only. Under side deep black but matt; the rusty band, however, always limited to the inner side of the ocellations, is better developed than on the upper side. This fine butterfly was taken in 1907 perfectly fresh and intact; it is without doubt the var. *valesiaca*, Elwes."

Turning again to Mr. Wheeler's account (*loc. cit.*), we find under *E. stygne*:—"Directions of Var. (a) tendency to obsolescence of mahogany patches containing the eye-spots, f. w. and h. w., culminating in:—

"Var. *valesiaca*, Elwes, in which they (the patches) are very slight, the eye-spots also, but not the pupils, being smaller."

I have several examples of this form in my collection taken by me on the Thusis-Andeer road just by the beautiful bridge in the narrow gorge above the first-mentioned village. They are certainly darker than typical *stygne*, but M. Oberthür does not mention any reduction of the size of the ocellated spots, which I take it is a distinguishing feature of this particular variety, and I suspect, therefore, that the Martigny example is rather an aberration of *valesiaca* than the form itself.

In the case of *E. tyndarus*, excessively common later on, it was hardly out at La Grave; all examined were of the form *cassioides*, von Hohenw. (= *dromus*, F.). On the detritus of the Meije moraine a few *E. gorge* males accompanied the larger *E. alecto* var., but I do not remember to have met with *E. mnestra* at this point, where, however, it was strange to find newly emerged *Pyrameis atalanta*—a butterfly seldom, I should imagine, associated in the same locality with *E. alecto*, though its congener *P. cardui*, also observed, attains almost as great altitudes in the Alps as *Aglais urticae*.

Until the hailstorm in the evening of the 15th wrecked their beauty, the pastures above and to the left of the herd hut suggested the Elysian Fields and the borrowed simile of the Church hymnal—

"The daylight is serene;  
The pastures of the Blessed  
Are decked in glorious sheen";

and the comparison was inevitable of these thousand white perfumed Mary lilies with the "asphodelos leimōn" of the Greeks. Here and there they would be broken up by little bushes of



rose-flushed rhododendron, and in delicate contrast the hollows would be alight with the delicate late lilac of the cranesbill, or with golden arnica daisies, deep purple asters, and blue campanulas. The cranesbills were especially attractive to males and females alike of *C. hippothoë* var. *eurybia*, and of course to *Polymmatius eumedon*. Hesperids were few and far between—*Hesperia alceus*, *H. serratula*, and *Pyrgus sao*. The Coliads were represented by *C. phicomone*, which was more common throughout La Grave than *E. stygne*.

My other excursions were all on this side of the river. The most interesting and productive was unquestionably that to the Evariste-Chancel hut (7875 ft.), and the woods and pastures on the way to the open treeless grass slopes which constitute the approaches to the neighbourhood of Lac Noir. The walk-up on July 15th was made under a tropical sun, which unfortunately withdrew altogether towards noon when I was on the rocks that encircle the grim lakelet, where, even thus late in the season, the ice was only now breaking up. Added to a cloudy sky, a furious wind began to blow, precursor of the evening's terrific thunderstorm. In the meadows on the outskirts of the lower woods *Brenthis ino* occurred in some numbers, and it was at a streamlet here that I surprised a dozen freshly emerged male *Argynnis aglaia* crowded on a patch of sand not larger than my hand. Everywhere from La Grave to the limit of the forest region *Parasemia plantaginis* was also in great force, but at first I failed to spot the variety *hospita*, common from about 6500 ft., and even more so at Le Lauteret. From the grass I netted several worn *H. malvoides*—the first record of this species hereabouts; and, as soon as I had quitted the larch belt, *H. cacaliæ* put in an appearance. The bare mountain-side yielded only occasional ragged females of *Pontia callidice*, *E. gorge*, and more abundant *E. lappona*. *B. pales* was extremely rare, but the later part of the day was against collecting. I was more fortunate on the 18th when I returned to the same ground below the rocks, and though the wind, which marred all collecting for the next week, never dropped, butterflies were not un plentiful in sheltered places.

The presence of *H. cacaliæ*, of which this day I saw many examples, but could capture few good specimens, had inspired me with hopes of the rare *H. andromedæ*. I had evidently overlooked it on the 15th, for directly I passed the tree line to where a spring of excellent water crosses the path, I encountered several. The males were not worth boxing, being in poor plight; of the females I took three perfect examples, and missed as many more, liberating at least half-a-dozen of both sexes. Some doubt apparently having existed as to the specific identity of these two skippers, I may state that in Dauphiny, at any rate, their habits are quite unlike. *Andromedæ* prefers to



settle on a sun-warmed rock, *cacalie* on flowers and grasses; *Andromedæ* is a much stronger and more active butterfly, while *cacalie* appeared to be generally on the wane when the latter was fresh of both sexes. I am not sure whether the food-plant of *Andromedæ* is known, but I dislodged one female evidently ovipositing on *Dryas octopetala*, which is common at these altitudes. *Andromedæ* begins to show at about the lowest flight of *Erebia lappona* (6500–7000 ft.), as I found it about Eaux-Bonnes in the western Pyrenees (Entom. xlv. p. 337), of which locality, with its sparse flora, ranunculus, myosotis, and accidental rhododendron, the Dauphiny habitat is decidedly reminiscent (Lépid. Comparée, fasc. v. pte. 2, pp. 108–9).

The morning of the 19th was devoted to the lower part of this walk, chiefly under the torrent of the Meije, where there is plenty of good collecting ground. The sunny path with occasional dripping water attracts swarms of insects of all Orders. *Hesperia carlinæ* males were in perfect condition, and among the Lycænids I spotted, on the wing, like a silvery *P. eros*, which species was swarming at the time, a solitary and perfect male *P. donzelii*. It was a welcome visitor; I had not seen this loveliest of Alpine "Blues" alive since I was at Trafoi and Cortina fourteen years ago; nor was I destined to see it again this year. Two or three fine female *E. pharte* were selected from the many on the wing; *E. curyale* was now commoner than ever, both here and along the river-bed where I sought refuge from the prevailing hurricane on the 16th, and on the finer 14th. The flora consists almost wholly of leguminous plants. As might be expected, therefore, there was abundance of Lycænids, chiefly *P. hylas* and *P. escheri*. Of the former I managed to box a female with the basal and median area of all the wings on the upper side suffused with blue (=ab. *cœrulescens*, Obthr.). It is the only blue female in my collection, for there is apparently in western Europe a far less pronounced tendency in the sex of this species to assume the male coloration than in the majority of the group possessing andromorphic females. Other Lycænids of the river-bed were *P. damon*, hardly out; and *P. thersites*, one or two males.

The Anthrocerids (Zygænidæ) observed at La Grave are not many—*A. transalpina*, *A. purpuralis*, *A. loniceræ* and *A. exulans*. Unfortunately I had omitted to provide myself with a *résumé* of Mr. Lowe's captures, and thus overlooked the locality, a mile below the village, where, in conjunction with Mr. A. H. Jones, he discovered *Melitæa deione*. On the 21st I left for Le Lauteret.

(To be continued.)

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE  
BRITISH BRACONIDÆ. No. 2.—MACROCENTRIDÆ,  
WITH DESCRIPTIONS OF TWO NEW SPECIES.

By G. T. LYLE, F.E.S.

(Concluded from p. 262.)

*M. collaris* (Spin.).\*—Appears to be fairly common and generally distributed. Is easily distinguished from its near relatives by the second abscissa of the radius being much shorter than the first intercubital nervure. The terebra is the length of the abdomen. In eight females which I have examined I find the antennæ to have 32-33 joints, and two males have each 37 joints.

I have not seen the original description, having identified my specimens from the writings of Wesmæl and Marshall.

ZELE (Curtis).

Large insects; in fact, *Z. testaceator* is probably our largest British braconid. Solitary parasites of the larvæ of Lepidoptera.

The testaceous species bear a superficial resemblance to insects of the genera *Ophion* and *Paniscus* among the Ichneumonids, and also to some of the *Meteori*; from the latter they may easily be distinguished by the sessile abdomen and by the neururation of the fore wings (see Entom. xlvii. 76, plate I. fig. 1).

These parasites leave their hosts when the latter are full-fed, so that in all the instances recorded their cocoons have been found underground within the cocoons or pupal chambers of the hosts.

When emerging from the cocoon the imago removes a cap from one end, but not so neatly as with the *Meteori*.

- |     |   |                                  |
|-----|---|----------------------------------|
| (6) | 1. Radial areolet of the hind wings not geminated by a transverse nervure.        |                                  |
| (5) | 2. Large species expanding 17-22 mm.  |                                  |
| (4) | 3. Wings hyaline or yellowish hyaline, terebra surpassing the apex of the abdomen | 1. <i>testaceator</i> , Curtis.  |
| (3) | 4. Wings somewhat clouded, terebra not surpassing the apex of the abdomen         | 2. <i>infumator</i> , sp. nov.   |
| (2) | 5. Smaller species expanding 12-14 mm.  | 3. <i>chlorophthalma</i> , Nees. |
| (1) | 6. Radial areolet of hind wings geminated   | ( <i>Homolobus</i> , Forster).   |
| (8) | 7. Colour rufo-testaceous   | 4. <i>geminator</i> , nom. nov.  |
| (7) | 8. Colour nigrescent  | 5. <i>discolor</i> , Wesm.       |

*Z. testaceator* (Curtis).—Four records only can I find of the breeding of this species, and in every case from the larva of a *Noctua*. I have never bred or captured it myself, the only

\* Spinola, Ins. Lig. ii. p. 140.

examples I possess being two ancient specimens which were given to me some years ago. Fortunately I have been able to inspect a fine series of nine in Morley's collection, and three in that of Col. Nurse. With one possible exception all the specimens I have examined have the costal cell rather shorter than the median, and the recurrent nervure rejected by a distance which is equal to or rather less than the length of the first abscissa of the radius (fig. 4). Wings yellowish hyaline. The upper surface of the abdomen is generally, though not always, fuscous.

The cocoon I have not seen, and the only description I know of is that of Fitch (Entom. xiv. 143), who tells us that it is *thin*, smooth, and white.

Among Morley's insects are two females bred by Cockayne from larvæ of *Taniocampa populeti* taken in Berkshire.

*Z. infumator*, sp. nov. (Fig. 2.)

Thorax, abdomen, and legs, including the hind tarsi, rufo-testaceous; claws black, and also a black dot above the radices. Palpi pale testaceous; mandibles fuscous at the tips; antennæ testaceous, annulated, darker towards the apices, longer than the body in both sexes. Metathorax marked with a rather elaborate raised pattern, which, though often not so symmetrical as in the case figured (fig. 5) (taken from a specimen in my collection, No. 530), is always present in a more or less perfect condition. Wings dull hyaline, *apical half somewhat infumated*, costal cell as long as or slightly longer than the median. Costa, nervures, and stigma fuscous, *recurrent nervure rejected by a distance which is greater than the length of the first abscissa of the radius*. Radial areolet of the hind wings not geminated by a transverse nervure. Abdomen smooth, terebra not surpassing the anus. Length, 9-11 mm., expands 17-22 mm.

Described from thirteen males and eleven females.

Approaches *Z. testaceator* in size, but differs therefrom in having the terebra concealed, infumated wings, and a shorter first abscissa of the radius, &c.; from *Z. chloropthalma* it differs in size and also in the infumated wings, &c.

Larva dirty cream colour, showing under magnification irregular white speckles on the last six or seven segments, attenuate towards the head, parts of the mouth not or scarcely outlined.

The cocoon is *thick*, white, somewhat rough but not woolly, attenuated similarly at both extremities, and  $10\frac{1}{2}$  to 13 mm. in length; when exposed to damp it turns a brownish colour (fig. 9).

Very many times bred from larvæ of *Boarmia repandata* between May 4th and June 1st, from which host Major Robertson has also bred it at Chandler's Ford. The parasite larva leaves its host when the latter is full-fed and has retired below the ground for pupation, and there spins its cocoon.

*Z. chloropthalma* (Nees). *Rhogas chloropthalmus*, Nees, Mon. i. 202 — *Phylax chloropthalmus*, Wesm., Nouv. Mem. Ac. Brux.,



1835, p. 162. Owing, no doubt, to an oversight this species has been confused by Marshall with another (see *Z. geminator*), and has apparently been overlooked in this country.

Wesmael says that, besides being much smaller, it differs from *Z. testaceator*:—"1. En ce que les tarses ne sont pas plus pâles que le reste des pieds; 2. le dos de l'abdomen du mâle est entièrement fauve testacé; 3. Tarière de la femelle dans l'état de repos n'est pas saillante, parce qu'elle est trop courte pour dépasser l'extrémité dorsale de l'abdomen."

Nees considered his *Rhogas chlorophthalmus* to be the *Bracon chlorophthalma* of Spinola, but, as Marshall remarks, this cannot be proved.\*

Among Fitch's insects I found a female which agrees perfectly with the descriptions of Nees and Wesmael. It was bred by G. Elisha, July 17th, 1884, from a larva of *Depressaria alstrœmeriana*. The specimen is 7 mm. long and 12 mm. in expanse, wings hyaline, terebra concealed, recurrent nervure rejected by a distance equal to the length of the first abscissa of the radius, and the radial areolet of the hind wing not geminated by a transverse nervure.

*Z. geminator* (nom. nov.) = *Z. chlorophthalmus*, Hal. Ent. Mag. iii. 142; Marsh, Trans. Entom. Soc. 1888, p. 199; Bignell, Trans. Dev. Ass. for Advan. Science, &c., 1901, p. 657; Morley, Entom. xl. p. 254.—In the Ent. Mag. for 1836 Haliday described a species under the name of *Z. chlorophthalmus*, which he considered synonymous with *Rhogas chlorophthalmus* of Nees.† He was at that time, as we know, unacquainted with the work of Wesmael, who, the year before, 1835, had described his *Phylax chlorophthalmus* ‡ also as synonymous with the Neesian species. In Wesmael's description the radial areolet of the hind wing is given as *not* geminated, while Haliday is most emphatic in saying that it is divided by a transverse nervure. Therefore, it is very evident that the synonymy of either Wesmael or Haliday must be wrong. In the description of Nees, unfortunately, no mention is made of the neururation of the hind wing, but it is extremely unlikely that so careful an observer would have omitted to note such an important character as the gemination of the radial areolet, had it occurred in the insect he described. We may, I think, take it that *Rhogas chlorophthalmus*, Nees = *Phylax chlorophthalmus*, Wesm., which necessitates the bestowal of a new name on Haliday's insect. For this well-marked species I therefore suggest the name of *Zelee geminator*, and subjoin a copy of Haliday's description:—

"Fem. præcedenti similis (*Z. testaceator*) statura tota gracilior; abdomen brevius, clavatum, minus compressum; aculeo ascendente, vix apicem abdominis superante; pedes

\* Trans. Entom. Soc., 1888, part 3, p. 300.

† Nees, Mon., i. 202.

‡ Nouv. Mem. Ac. Brux., p. 162.



graciliores; tarsi omnes concolores; alæ ampliores; anticarum stigma et areola radialis latiores; posticarum area radialis a branchiali remota, *et in 2 areolas partita*."

It seems strange that Marshall, when preparing his Monograph, should not have noticed the discrepancy between the descriptions of Wesmael and Haliday. The species appears to be scarce, the only specimen I have seen being in Morley's collection, a female which was captured by the late Rev. E. M. Blomfield at Guestling in 1889. This insect expands 16 mm., and agrees in every particular with Haliday's description, the radial areolet of the hind wing being very distinctly geminated by a transverse nervure.

*Z. discolor* (Wesmael). (Fig. 3.)—Strange to say the male of this species is unknown. Wesmael, the original describer, saw only three females; Bignell bred the same sex only; Morley's single specimen is a female, as are also all the many specimens I have bred.

A large and graceful insect,  $6\frac{1}{2}$  to 8 mm. in length, and expanding 15–20 mm. I possess a specimen which is but 5 mm. in length and expands only 12 mm.; this case, however, is quite exceptional, and may probably be attributed to malnutrition of the host. The wings are somewhat infumated, the apical halves more distinctly so, and noticeably iridescent. Marshall very correctly describes the cocoon as "elongate, oval, white, and thin, with a medial zone of a denser texture forming a white band." This medial band is scarcely visible when the cocoon is empty. The cocoon is much thinner and more shining than that of *Z. infumator*,  $7\frac{1}{2}$  to  $11\frac{1}{2}$  mm. in length (fig. 10). It is constructed underground.

Bred by me many times from larvæ of *Cabera pusaria* from July 27th to August 8th, and again from September 27th to October 10th; also frequently from larvæ of *Boarmia repandata* between May 5th and May 28th; and once from a larva of *Gonodontis bidentata*, August 18th, 1912.

In October, 1911, I took a small larva of *Boarmia repandata*, which, being kept in a warm cupboard, fed up, and when full grown produced a larva of this parasite on January 31st, 1912. From this I should judge that in the ordinary way the species passes the winter within the body of its host, either as an ovum or small larva.

## NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

### *Semiothisa kanshireiensis*, n. sp.

♀. Pale brown thickly sprinkled with dark brown and blackish; subbasal and medial lines blackish, each originating in a black spot on the costa, slightly curved, interrupted and edged with orange; post-medial line blackish, indented below costa, wavy towards dorsum,

inwardly edged with orange, followed by a greyish band on which is a blackish costal spot and two black marks just above middle; terminal area suffused with grey; terminal line black, interrupted at the veins; fringes orange marked with black. Hind wings have two blackish transverse lines, the first is edged with orange and united with a black discoidal mark, the second is inwardly edged with orange; area beyond second line suffused with grey; terminal line black, dilated between veins; fringes dark grey, orange at base and tips. Under side orange sparsely freckled with black-brown; transverse lines as on the upper side, but blacker and more distinct.

Expanse, 24 millim.

Collection number, 1642.

One female specimen from Kanshirei, September 14th, 1908.

*Semiothisa dubia*, n. sp.

♀. Head and front of thorax brown, rest of thorax brown-grey. Fore wings brown-grey flecked with black on costa; antemedial line brown, curved, indistinct, dotted with black; postmedial line brown, almost parallel with termen, not distinct towards the costa; subterminal line indicated by black dots and a blackish cloud, the latter on vein 5. Hind wings brown-grey flecked with black on costal area; traces of dusky medial and postmedial lines, the latter dotted with black. Fringes of all the wings brown, marked with black. Under side greyer than above; fore wings suffused with brown on the disc; markings pretty much as on upper side.

Expanse, 32 millim.

Collection number, 1887.

A female specimen from Rantaizan, May 6th, 1909.

*Heterolocha olivescens*, sp. n.

♂. Head whitish, palpi and pectinated antennæ brown; thorax and abdomen pale olive brown. Fore wings pale olive brown; antemedial line fuscous, curved, connected with a small fuscous cloud in cell; discoidal mark black, linear; postmedial line fuscous, outwardly edged with white, inwardly oblique from apex to vein 2, where it is elbowed, terminating on dorsum near the tornus; area beyond the postmedial line clouded with whitish. Hind wings pale olive brown; discoidal mark blackish, indistinct; postmedial line fuscous, outwardly edged with white, almost straight; terminal area clouded with whitish. Under side similar to the upper side but the postmedial line on all the wings is darker and the area within the line yellower.

Expanse, 38 millim.

Collection number, 1596.

A male specimen from Arizan (7300 ft.), August 21st, 1908.

*Prionia pulchra*, sp. n.

♂. Head and thorax carmine, frons rather darker; abdomen carmine, yellowish between segments. Fore wings carmine with two yellow transverse lines, the first almost straight, the second curved

to apex where it unites with a large yellow blotch. Hind wings rather paler than the fore wings, a yellow transverse line, only well defined on the dorsum. Under side carmine, a large yellow spot at apex of the fore wings.

Expanse, 40 millim.

Collection number, 1890.

One male specimen from Rantaizan, February 17th, 1909.

Closely allied to *P. rosearia*, Leech.

*Gonanticlea subfalcata*, sp. n.

♂. Fore wings, which are deeply excised below apex, pale brown with many blackish (black on costa) almost parallel transverse lines; subbasal line black, double, commencing in a black spot on the costa; postmedial line pale ochreous, obtusely serrate, indistinct, edged and partly obscured towards the costa by a black transverse streak; area beyond the postmedial line darkened. Hind wings fuscous. Under side fuscous grey; fore wings ochreous on the costa, discoidal dot black, transverse lines faintly in evidence; hind wings have a black discoidal dot and dusky medial and postmedial lines, outer edge of postmedial pale ochreous towards dorsum.

Expanse, 32 millim.

Collection number, 1881.

A male specimen from Arizan, March 23rd, 1908.

Seems to be allied to *G. aversa*, Swinhoe.

*Acasis venipicta*, sp. n.

♂. Fore wings pale greyish brown, venation black marked with white; medial band darker brown, the inner edge irregular, the outer edge elbowed beyond the cell, thence incurved to dorsum, marked with black towards costa; discoidal mark black, linear; fringes pale grey marked with blackish at ends of the veins. Hind wings and under side fuscous.

Expanse, 36 millim.

Collection number, 1607.

A male specimen from Rantaizan, May 4th, 1909.

Allied to *A. obscuraria*, Leech.

*Dindica taiwana*, sp. n.

♂. Head and thorax yellowish green mixed with black, and on mesothorax with brown, antennae bipectinated; abdomen paler in colour, segmented divisions whitish, tufts mixed with black, an interrupted black line on each side of tufts. Fore wings yellowish green; subbasal line black, oblique, not extending to dorsum; ante-medial line black, wavy, indistinct, clouded with blackish and preceded by a blackish patch on the costa; discoidal mark blackish; postmedial line blackish, outwardly oblique from the costa to vein 4, thence curved and recurved to the dorsum, dotted with black on the veins; subapical patch blackish tinged with brown on lower edge; terminal dots black. Hind wings whitish, faintly brownish tinged on the dorsal area; subterminal band blackish, interrupted,

area beyond yellowish green clouded with blackish; terminal line black, interrupted. Under side whitish; all the wings have a blackish discoidal mark and band beyond, the discoidal mark of fore wings large and distinct.

♀. Similar, but markings of the fore wing less distinct and the outer third of the hind wings almost entirely blackish.

Expanse, ♂, 50 millim; ♀, 54 millim.

Collection number, 1859.

One example of each sex from Arizan; the male obtained March 19th, 1909, and the female July, 1908.

This species comes very near to *D. polyphænaria*, Guen., but the fore wings are somewhat broader and the hind wings are whitish.

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## AN EXPEDITION IN SEARCH OF RUSSIAN BUTTERFLIES.

BY W. G. SHELDON, F.E.S.

(Continued from p. 274.)

*Glaucopsyche cyllarus*.—Not uncommon at Ialta and Novorossisk, and abundant at Sarepta, where it was seen on our first day, and fresh examples kept emerging during the whole time of our visit; evidently these were delayed emergences of the first brood and not a second brood. The specimens taken were of average size, the females entirely brown; both sexes had a maximum of blue scales on the bases of the wings underneath, and less than the average number of ocelli; the inferiors were in some cases entirely devoid of ocelli.

*Lycaena arion*.—This species was common at Sarepta on and after May 28th; it was local but widely distributed, and was always found in the vicinity of wild thyme. The race is a handsome one, usually the blue lowland form, but a few var. *obscura* were taken; the black spots on the upper sides are well-developed, and in many cases elongated and lanceolate in shape.

*Celastrina argiolus*.—Not uncommon at Ialta. First seen as a second brood at Sarepta on June 17th; the black spots on the under sides are larger than those of Western Europe examples.

*Libythea celtis*.—This species was not uncommon alongside the lower road from Ialta to Gourzoff. The specimens, of course, had passed the winter in hibernation.

*Neptis lucilla*.—It was one of the most fascinating experiences of our stay at Sarepta to see the abundance of this graceful species, usually so rare in mid-Europe. I am aware that one or two localities there, including Botzen, produce it in some numbers, but not, I think, in anything like the abundance that it is found on the Volga. Everywhere in and around woods it swarmed to such an extent that there were often ten to a dozen specimens within a yard or two of one. The only locality in which I had previously met with *N. lucilla* was Herculesbad, where it was so rare that my two dozen specimens involved something like an 18,000 ft. climb. At Sarepta any day at



the end of May or in the beginning of June I could have netted with ease a hundred specimens in a morning. It was most abundant in the small woods in the valleys of the hills some miles on the road to Tsaritsyn; but it was also exceedingly common in the "Tschapurnik Wald," and specimens were to be found in every small wood that we worked. I took the first specimen on May 22nd.

*Polygonia c-album*.—I only saw two examples of this species; these were taken on June 12th in a wooded valley opposite Sarepta; they have very pale under sides and are extreme forms of var. *hutchinsoni*.

*Eugonia polychloros*.—A single example was taken on June 20th, sunning itself on a wooden barn. One or two hibernated specimens were seen at Ialta.

*Pyrameis cardui*.—Common wherever we collected in Russia, and especially so at Sarepta; a succession of emergences occurred there during the whole period of our stay.

*P. atalanta*.—A few at Ialta. At Sarepta only seen in the "Tschapurnik Wald," where there was an abundant growth of nettle; a plant usually rare in the district.

*Melitaea aurinia* var. *sareptana*.—This handsome form of *M. aurinia* was seen not uncommonly, when its localities were discovered, but it was very local, haunting bushy slopes. It was first seen on May 22nd, on which day all the specimens were worn; eventually, about a week afterwards, I found a locality in which there was a small and late brood flying, and there managed to get about a dozen good specimens. It probably emerges at Sarepta about the first week in May.

*M. cinxia*.—One of the most abundant and widely distributed butterflies we met with. The form found at Ialta and Novorossisk is very normal, but at Sarepta all forms from the type to var. *obscurior* occurred. There was a succession of emergences during the whole time of our stay, and perfect examples were to be obtained quite at the end of it.

*M. phæbe* var. *aetheria*.—Common and in good condition at Sarepta during the first few days of our stay, after which it rapidly became worn.

*M. aurelia* var. *seminigra*.—A very remarkable form of a *melitaea*, the genitalia of which are practically identical with Hungarian *M. aurelia*, was found rarely in the "Tschapurnik Wald." This form, which has superficially many *aurelia* characteristics, is much darker than the type, both on the upper and under sides, and the female especially is darker on the upper side than *M. dictynna*. It agrees with *M. aurelia* var. *seminigra*, figured and described by Seitz from specimens taken near Lake Baikal. Only three specimens were captured, a male by myself on May 29th, and on June 6th a female by each of us. This eastern form of *M. aurelia* is considerably larger than Swiss or Hungarian examples of that species; my male and female expand respectively 44 mm. and 47 mm. as against 38 mm. and 42 mm., the average size of my Hungarian and Swiss specimens, and these again appear somewhat larger than the average, judging from the fact that Mr. Wheeler in his 'Butterflies of the Alps,' gives 32 mm. as the wing expanse of this species.

*M. didyma*.—Common but somewhat local at Sarepta; most abundant on the railway banks, but odd specimens were taken in various other places; a remarkably fine and variable series was secured. The Russian Steppe form is usually what is known as var. *neera*, and the majority of my specimens come near to this form, but there are numerous aberrations from it. All the examples from Sarepta are much larger than those taken in Mid-Europe; my largest example, a female, expands 60 mm. as against 50 mm., the expanse of my largest Mid-European female. In var. *neera* the colour of the male is even more fiery than the type, the females also are very red, in one or two examples quite as red as the male. The only specimen seen at Novorossisk is a male, very typical in size and markings. *M. didyma* was first seen at Sarepta on May 21st, and it continued in good condition until the end of our stay.

*M. trivia*.—In the greatest abundance in clearings in the "Tschapurnik Wald," and not uncommon in all localities at Sarepta in which there was any wood. The specimens are mostly var. *fascelis*; some, however, are typical; the size of all is considerably in excess of those I have from Hungary, females ranging up to 50 mm. expanse. First seen on May 21st, when it was just commencing to emerge.

*Brenthis dia*.—Locally common at Novorossisk.

*B. daphne*.—Common locally in woods at Sarepta; the form is somewhat larger, and the orange-ground colour deeper than in Central European specimens; it comes very near var. *epidaphne*, Frühs. A larva which got into my net accidentally at the "Tschapurnik Wald" proved to be this species. I fed it upon *Spiraea filipendula*, a common plant in the Sarepta woods; this larva pupated on June 1st, and the imago emerged on June 15th. The following is a short account I made of the larva in the last stage:—Down the centre of the dorsal area is a broad white stripe; the sub-dorsal area is pale lemon yellow, with longitudinal dark lines, the spiracles are black. The pupa is light brown, with two golden pointed excrescences on each segment, the venation of the wings shows dark through the pupal skin. The pupa suspended itself from the top of the cage in which it was kept.

*B. euphrosyne*.—I feel pretty certain I saw this species at Novorossisk, but could not secure a specimen to make sure. At Sarepta it was rare, and, so far as I know, confined to the "Tschapurnik Wald," and nearly over at the date our visit commenced; probably it had been common earlier in the season. The form is a very striking one, with very pale under sides, and the silver markings on the margin of the inferiors are brighter and more prominent than in the type; it approaches var. *orphanus*, Frühs., from East Siberia.

*Issoria lathonia*.—Novorossisk and Sarepta, not common.

*Argynnis niobe*.—A remarkably fine race was abundant in all the woods at Sarepta from May 22nd onwards. This form has been described and figured by Seitz as var. *kuhlmanni*; it is larger and of a much brighter red on the upper surfaces, and more variegated on the under sides than Central European *A. niobe*; the predominant form of under side is var. *eris*, but some of the females have the

amount of silver spots that obtain in the type, and some have only the outer row of spots on the hind wings silver.

*Melanargia galatea*.—A rather large form of var. *procida* became common in clearings in the "Tschapurnik Wald" during the last few days of our stay at Sarepta. It was first seen on June 16th; by June 20th males were common, and two days later, my last day, I took two females.

*M. iapygia* var. *suwarovius*.—This fine *Melanargia* was to be found wherever grass grew abundantly amongst the usual plants of the steppe on the hills at Sarepta; but this was not by any means everywhere, for the butterfly was very local. We were on the lookout for it during the first days of June, but did not actually see it until the 9th of that month. On the morning of that day I was searching the grassy hills some three or four miles to the north-west of Sarepta; about 9 a.m. I saw a large white butterfly flying some distance away, which at first I thought was *Aporia crataegi*; as it approached nearer, the variegated pattern and the grey tint of the wings became apparent, stamping it as undoubtedly *M. var. suwarovius*. I made a series of frantic efforts to effect a capture, but without success, for this species when alarmed goes very fast, and as its flight is very dodgy, there is not much chance of succeeding under these conditions. I only secured one specimen on that day, although I spent most of the morning in quest of the species; later I found out its headquarters and habits, and on June 13th and 15th obtained all I required.

*M. var. suwarovius* at Sarepta is to be found freely amongst the flowers which grow in its haunts, flying quietly amongst and settling upon them. In the locality I have described, on the slope facing the Volga, there are at intervals small hollows with a certain amount of low scrubby bushes growing in them; in the spaces between these bushes there is a luxuriant growth of flowers, and these are the spots where this fine butterfly is at home. A small hollow would be the haunt of from half-a-dozen to a dozen specimens. The flowers frequented included a species of *Achillea*, various *Carduus*, and a brilliant purple *Salvia*.

*Erebia afer*.—This species was not uncommon at Novorossisk, but the specimens were mostly in bad condition at the date we were there; probably it had then been out quite a month. The butterflies were flying over flowery slopes on the mountains south of the harbour, and within half a mile of the sea. They extended as low as 1000 ft., and above this level were found all the way up to the summits, which might attain an altitude of 1800 ft. *E. afer* has the usual slow flight of the genus, but is not easy to capture in consequence of the difficulty in traversing the steep slopes it frequents.

*Satyrus circe*.—So far as we saw, this species was confined to the "Tschapurnik Wald," where it was first seen on June 11th; it was locally abundant in clearings in this wood, males only, which were rather small; my largest example is 76 mm. in expanse.

*S. hermione*.—An exceedingly striking and aberrant form occurred in the same localities as the last species on June 20th and 22nd, males only. In this form the light band on the upper side of all the



wings has dark shading to such an extent that the whole appears to be almost black. This form is described in Seitz as var. *tetrica*, Fröhs.

*S. anthe*.—This fine Russian species was not by any means common; it frequented the tops and sides of dry hills a little to the south-east of Sarepta, and was very shy and difficult to approach; under these conditions I was only able to secure a very short series. First seen on June 14th.

(To be continued.)

## THE EMERGENCE OF *CONCHYLIS GIGANTANA* (*ALTERNANA*).

BY THE REV. W. G. WHITTINGHAM, F.E.S.

*Conchylis gigantana* feeds and pupates in the flower-heads of *Centaurea scabiosa*. The heads which contain the pupæ are generally small and somewhat misshapen; rather swollen on one side, for example. They have, as a rule, no trace of florets, only the chaffy scales being perceptible. The heads are sometimes so small that it seems likely that the larva has done part of its feeding in another flower-head, and having exhausted the supply of food, has crawled out to a fresh one before pupating. This is borne out by the fact that occasionally larger heads, which look like flowering, contain them.

A number of heads were obtained in the latter part of July, the imagines emerging from July 22nd to August 26th. The emergence took place, as a rule, in the morning, between 8 a.m. and 10 a.m., though occasionally they appeared later in the day, especially when the weather was cool. Two or three appeared in the afternoon. The following are the dates recorded and the number of insects emerging on them:—July 18th (one taken in the open); July 22nd (one); 23rd (two); 24th (one); 25th (three); 26th (one); 27th (two); 28th (one); 29th (three); 30th (four); 31st (two); August 2nd (five); 3rd (two); 4th (three); 5th (one); 6th (one); 7th (one); 9th (one); 10th (one); 12th (one); 13th (one); 14th (two); 15th (one); 17th (one); 22nd (one); 26th (one).

The process of the emergence was observed in several instances. The first indication was the appearance of the head of the pupa among the scales at the opening of the flower-head. When it had been noted that the insects usually appeared about breakfast time, a careful inspection at about the right time was again and again rewarded by the sudden appearance of a glint of shining brown pupal skin at the mouth of one or another seed-head. In a succession of slow rotary movements, accompanied by a faint sound as the parts of the plant gave before them, the pupa worked its way forward till more than half of it



stood out, the wing-cases being clear. There was then a pause of ten or fifteen minutes; after which the movements recommenced, the pupa perhaps pausing after a few minutes for another five or ten minutes' rest. In the course of these movements a slight crack presently appeared down the centre of the thorax. After a brief pause the crack widened slightly, and a similar very slight crack became visible transversely behind the collar, through which cracks the lighter colour of the imago was seen. This was followed by an opening down the front of the wing-cases behind the antennæ, the openings previously occurring, widening at the same time. The head was next pushed forward carrying the face, masked with the portion of the pupa-case lying over it, and the antennæ were partly withdrawn. The palpi followed, then the fore legs were extracted and the antennæ completely withdrawn. The face-mask then fell off, larger portions of the wings appeared, and the hinder legs were withdrawn, the abdomen still remaining in the pupa. The later movements followed one another very quickly; and on a sudden the imago ran out (that is the only term that describes it) and away from the pupa and settled on the side of the seed-head. All the opening movements were accompanied by a slight rotary motion, and some contraction and expansion of the rings of the abdomen, the final extrication being helped by pressure of the legs. The expansion of the wings was rapid, taking in some instances no more than from fifteen to twenty minutes. In all the cases observed the wings had been raised over the back and dropped to the sides fully expanded in from three-quarters of an hour to an hour and a half from the first appearance of the pupa at the opening of the seed-head.

Knight's Vicarage, Leicester.

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## NOTES AND OBSERVATIONS.

ACRONYCTA STRIGOSA IN WICKEN FEN.—The notes by Dr. Chapman and Mr. Robinson in recent numbers of 'The Entomologist' concerning *A. strigosa* are interesting. Like Mr. Robinson, I never heard of *strigosa* being taken actually in the Fen, although I have been told that it used to be taken not far off, together with *atriplicis* and *ocularis*. I have beaten the larvæ once from hawthorn along a certain dyke which terminates at a small village not far from Wicken, and the late Rev. Bailey used to beat it from hawthorn the Soham side of Wicken village. In the old "dyke" locality a number of the hawthorns are very old, and most of them have decaying stumps attached, where, no doubt, *strigosa* would find suitable material in which to pupate; but does—or perhaps one should now say *did*—the larva of *strigosa* invariably enter rotten wood to pupate? I had several larvæ of *Jochæra alni* this year, and I was always under the impression that they failed to pupate if they

were not supplied with rotten wood. Three out of seven larvæ spun up quite comfortably in withered hawthorn leaves, disregarding the material I had provided, and, further, all three pupated successfully. It is possible that *strigosa* may have done the same when unable to make use of rotten wood.—G. BERTRAM RENSHAW, F.E.S.; West Wickham, Kent, September 30th, 1914.

WICKEN FEN.—Anyone interested in the Fen should write to Mr. A. H. Evans, 9, Harvey Road, Cambridge, the Local Secretary of the National Trust, who is taking a great interest in the welfare of the Fen, and who, I feel sure, would be only too glad of suggestions on his return from Australia. My advice to him, as the Fen is now too overgrown, was to leave bands of the older growth across the Fen and to cut strips of, say, eight acres cleared of bushes, these to be cut every fourth year in rotation. This would provide good shelter, and at the same time give the flowers a chance of appearing again. Of course, there are many spots where special insects seem to be confined to a small area, these he has kindly consented to leave untouched. As regards the notes on *A. strigosa* in your last numbers, it certainly used to be taken in the Fen and in the lane, the latter probably is its habitat, as there are few thorn bushes in the Fen. I may add that it pupates freely in old reeds, if rotten wood is scarce. It is, I think, an interesting fact that *S. straminea* and *S. maritima* have appeared within recent years, and *B. argentula*, introduced by S. Bailey, is abundant, so we may still hope other species may appear from the preservation of the Fen.—E. B. NEVINSON; Morland, Cobham, September 5th.

A NOTE ON ACRONYCTA STRIGOSA.—Dr. Chapman's appeal for the preservation of all vegetation suited to *Acronycta strigosa* at Wicken Fen will doubtless be followed by further notes on the subject from those who are well acquainted with the habitat of this insect in South Cambridgeshire. While the subject is under discussion it may also be of interest to bring together the few records of *strigosa* from a district in North Cambridgeshire, since it appears that there is some misapprehension as to the type of country inhabited by the species. The district to which I refer may be roughly described as that surrounding the town of Chatteris, which is about twenty miles north-west of Wicken, close to the Huntingdonshire border of the Isle of Ely. The first specimen from this locality was taken on July 10th, 1876, by Mr. A. H. Ruston, who caught it flying at dusk along a hedge close to the town on land which is not, and never has been, of a marshy nature. It may also be of interest to record that within a few hundred yards of Mr. Ruston's locality my father formerly took *Hadena atriplicis*, a species which now seems to have practically disappeared. From 1876 to 1903 there are no records of *strigosa* at Chatteris, but in 1904 I took a single specimen at sugar early in July in a locality about five miles from the town. This locality is practically on the county boundary, and also is not of a marshy nature. The only other species of interest which occurred there was *Agrotis ravidula*, which was then quite common, but subsequently became very scarce. In 1905 I again found *A. strigosa*, obtaining two larvæ by beating towards the end of

August. These larvæ occurred on blackthorn in a very old hedge in Huntingdonshire, about two miles from the locality of the 1904 specimen. The country round is typical of the greater portion of the county, and has little in common with fenland. Species found there are *Zygena filipendulæ*, *Procris statices*, *Cymatophora octogesima*, *Xylophasia sublustris*, *Teniocampa opima*, *T. populeti*, and once a single specimen of *Dicycla oo*.

The following year, 1906, early in July, I also met with *strigosa*, but in a fresh locality, some four miles to the north-east of Chatteris, and therefore well in the county of Cambridge. This specimen was on a sugared bramble flower, and the circumstances of the capture are firmly fixed in my memory as the insect fell from the flower into the middle of the bramble clump, which had to be cut away piece-meal before the moth was found under a dead leaf at the bottom. In 1907 the same locality produced a further specimen, a female from which I tried in vain to obtain eggs. The locality of these last two captures differs from those previously mentioned in being of a distinctly "fenny" nature, for in it occur *Leucania obsoleta*, *L. straminea*, *Senta ulvæ*, and *Cænobia rufa*. There are, however, numerous old hawthorn bushes which doubtless form the food-plant of the *Acronycta*. Since 1907, owing to absence abroad and for other reasons, I have had no opportunities of observing *strigosa*, but I have little doubt that a systematic search for either the imago or larva would be successful. From the comparatively large area over which my captures were made, and from the fact that I never specially sought the insect, I am inclined to think that it is widely distributed and not very scarce in this section of the county. It appears, however, to be a survivor of an ancient fauna inhabiting the islands in fenland and its borders, rather than a native of the true marshes. Among the latter Wicken Fen must be included, and there is, therefore, no reason to fear that the position of the species in this country will be prejudiced in any way by the clearing of small patches of scrub within the boundaries of the fen itself.—J. C. F. FRYER, M.A., F.E.S.

**FORFICULA GIGANTEA.**—While staying at Southbourne, near Bournemouth, recently, I was fortunate enough to find a female *Forficula gigantea* under stones at the foot of the cliffs. Although I spent the afternoon searching, this was the only specimen seen.—R. D. GOOD; 48, High West Street, Dorchester, Dorset, October 8th, 1914.

**NEMEOBIUS LUCINA EMERGING IN OCTOBER.**—A female of this species emerged to-day bred from ova collected at Oxford at the end of May. There has been no artificial heat in the room where the pupæ were kept. I see it is stated in 'Butterflies of the British Isles' that this butterfly occasionally emerges in August and I have looked at my breeding-cage and cannot find any others. It was lucky that I was at home on leave from my camp.—F. W. J. JACKSON; Woodcote End House, Epsom, October 18th, 1914.

**COLIAS EDUSA IN DORSETSHIRE.**—During September I twice noticed *C. edusa* flying in the neighbourhood of this town.—R. D. GOOD; 48, High West Street, Dorchester.



**OCCURRENCE OF VANESSA ANTIOPA IN 1914.**—The capture of three specimens of *Vanessa antiopa* has been recorded in the 'Field' during the past autumn, from Norfolk, Surrey and Sussex, as follows:—One at Worthing on August 17th reported by Mr. H. Wells; one captured and another seen at Addlestone, Surrey, on August 18th, by Mr. J. H. Milne; one captured on September 24th at Scole, Norfolk, by the Rev. Wilson W. White; the specimen had been seen for several days previously, feeding on apples partly eaten by wasps.—F. W. FROHAWK.

**PAPILIO MACHAON IN KENT.**—It may be of interest to note that I saw a specimen of *Papilio machaon* in a cottage garden at Hook Green, about three miles from Frant Station, on August 29th.—E. D. MORGAN; 24, Queen's Road, Tunbridge Wells, Kent, September 24th, 1914.

**ENTOMOLOGICAL JOTTINGS FROM CHICHESTER.**—One prominent feature of the season here has been the abundance during September of *Pyrameis cardui*. They were to be seen flying in divers places, gardens amongst others. The first brood of *Cyaniris argioides* appeared in the last week of April, the second in August. A few *Colias edusa* were noticed in the middle of August, all the insects observed being males. Several larvæ of *Manduca atropos* were found in potatoes, the first on July 30. A fine female emerged on September 25. For one or two days before doing so the pupa frequently squeaked, as also did the imago.—JOSEPH ANDERSON.

**OCCURRENCE OF PHASGONURA VIRIDISSIMA NEAR FELIXSTOWE.**—On September 22nd a large green grasshopper was brought to me alive, having been captured in a meadow near Felixstowe, in Suffolk, two days previously. Mr. W. J. Lucas has very kindly identified it as a female of *Phasgonura viridissima*, and writes me that "it is fairly common in places."—GERARD H. GURNEY; Keswick Hall, Norfolk.

**ABUNDANCE OF MIDDLESEX LEPIDOPTERA IN 1914.**—To the extraordinary scarceness of almost all our commoner species of butterflies last year the season now passed has afforded a welcome contrast. Here in Middlesex the three "Whites" and *Euchloë cardamines* were plentiful in May; and from April 20th onwards *Celastrina argioides* occurred in quite unusual numbers in our garden, the second brood being already on the wane when I returned from France the first week in August. This little Blue has now completely established itself, and I find it scattered broadcast throughout the many suburban villa gardens which have sprung up of late years in the parish of Pinner. Other butterflies appearing in some profusion have been *Pyrameis atalanta* and *P. cardui*. The latter is a very rare visitor with us, and it is many years since I observed even a stray migrant in the spring. There must have been a numerous emergence in North Middlesex this year of the offspring of these most desirable aliens. Throughout September they haunted the zinnias and michaelmas daisies in company with their congener and *Chrysophanus phlæas*, of which I noticed several of the *cæruleopunctata* form. At about the same time *Heterocera* were



plentiful at light, the most common species being *Anchocelis lunosa*, which some evenings positively swarmed, and rarer *Polia flavicincta* and *Eumichtis protea*. The latter insect I do not remember to have observed before in this part of the county. There is an exquisitely faithful figure of it in M. J. Culot's 'Noctuelles d'Europe,' in my opinion by far the most accurate work of the kind ever attempted, and in every way worthy of the artist who has designed for so many years the plates of M. Charles Oberthür's beautiful 'Lépidoptérologie Comparée.' — H. ROWLAND-BROWN; Harrow Weald, Middlesex.

MOTHS CAPTURED BY LIGHT-TRAP (continued from p. 254):—

AUGUST.—*Leucania conigera*. 1st (one).—*L. lithargyria*. 1st (one).—*Apamea secalis*. 1st (one); 11th (one); 12th (one); 13th (one)=4.—*Hydræcia nictitans*. 1st (three); 12th (two); 13th (one); 16th (two); 17th (two); 18th (two); 19th (three); 20th (two); 21st (one); 23rd (one)=19.—*Selenia bilunaria*. 1st (one).—*Noctua plecta*. 1st (one); 12th (one)=2.—*Mesoleuca ocellata*. 1st (two); 13th (two); 19th (one); 20th (one); 24th (one)=7.—*Coremia ferrugata*. 1st (three); 2nd (one); 11th (one); 12th (two); 19th (one); 20th (two)=10.—*Plusia gamma*. 1st (one); 11th (one); 20th (one); 25th (one); 29th (one); 30th (one)=6.—*Cerigo matura*. 1st (one); 18th (one)=2.—*Anaitis plagiata*. 1st (one); 12th (one); 13th (one); 15th (one); 16th (one); 19th (four); 20th (three); 24th (three); 31st (one)=16.—*Agrotis puta*. 10th (one); 18th (two); 19th (one); 21st (one)=5.—*Triphæna pronuba*. 10th (one); 11th (one); 12th (one); 13th (one); 14th (one); 15th (one); 20th (two); 21st (one); 23rd (two); 24th (one); 27th (one); 29th (one)=14.—*Eupithecia oblongata*. 11th (one); 12th (one); 13th (one); 14th (one); 19th (one); 20th (four); 24th (one)=10.—*Xanthorhœ fluctuata*. 12th (one); 17th (one); 19th (one); 24th (one); 27th (one)=5.—*Phlogophora meticulosa*. 13th (one); 27th (two)=3.—*Luperina testacea*. 13th (one); 15th (four); 16th (four); 17th (five); 18th (ten); 19th (ten); 20th (fifteen); 21st (nine); 22nd (seven); 23rd (two); 24th (seven); 25th (one); 26th (four); 27th (seven); 28th (six); 29th (five); 30th (nine); 31st (six)=112.—*Hydræcia micacea*. 13th (two); 14th (one); 20th (one); 24th (four); 29th (one); 31st (one)=10.—*Crocalis elingvaria*. 13th (one); 14th (one); 17th (one); 24th (one)=4.—*Noctua xanthographa*. 13th (one); 19th (one); 20th (three); 23rd (one); 28th (one); 29th (four); 30th (one)=12.—*Ortholitha bipunctaria*. 14th (one); 15th (one)=2.—*Xylophasia monoglyphæ*. 15th (one); 24th (one); 27th (one)=3.—*Noctua rubi*. 15th (two); 16th (three); 20th (two); 23rd (two); 24th (one); 28th (one); 31st (one)=12.—*Miana bicoloria*. 17th (one).—*Timandra amata*. 18th (one).—*Phibalapteryx vitalbata*. 18th (two); 21st (one)=3.—*Lomaspilis marginata*. 20th (one).—*Leucania pallens*. 20th (one); 31st (one)=2.—*Pterostoma palpina*. 20th (one).—*Ligdia adustata*. 20th (one).—*Noctua c-nigrum*. 21st (one).—*Opisthographis luteolata*. 22nd (one); 24th (one); 28th (one); 30th (one)=4.—*Abrostola tripartita*. 23rd (one).—*Coremia designata*. 24th (one).—*Acidalia ornata*. 24th (one).—*Bryophila perla*. 24th (one).—*Amphipyra tragopogonis*. 24th (two).—*Tholera cespitis*. 24th (one); 25th (two); 27th (one);

28th (one); 29th (one)=6.—*Epineuronia popularis*. 27th (one); 28th (one)=2.—*Triphæna comes*. 27th (one).—*Ephyra linearia*. 28th (one).—*Cidaria truncata*. 29th (one).

SEPTEMBER.—*Luperina testacea*. 2nd (one); 3rd (one); 4th (two); 8th (one); 16th (one)=6.—*Tholeras cespitis*. 2nd (one); 5th (one)=2.—*Triphæna pronuba*. 2nd (one).—*Amphipyra tragopogonis*. 2nd (one).—*Xanthorhoë fluctuata*. 3rd (one).—*Caradrina morpheus*. 4th (one).—*Phlogophora meticulosa*. 7th (one); 23rd (one); 26th (one)=3.—*Noctua xanthographa*. 7th (one).—*Thera variata*. 8th (one); 26th (one)=2.—*Omphalocelis lunosa*. 13th (one); 16th (five); 18th (six); 20th (one); 21st (two); 22nd (two); 23rd (three); 24th (one); 25th (one)=22.—*Xanthia fulvago*. 15th (one); 24th (one)=2.—*Plusia gamma*. 16th (one); 18th (one); 21st (one); 26th (one); 27th (one)=5.—*Amathes lychnidis*. 18th (two); 20th (three); 21st (one); 22nd (four); 23rd (one); 24th (three); 25th (ten); 26th (thirty-one); 27th (eighteen); 28th (seven); 29th (eight)=88.—*Aporophyla nigra*. 18th (one).—*Ochria ochracea*. 18th (one).—*Leucania impura*. 18th (one).—*Hydræcia micacea*. 23rd (one).—*Xanthia lutea (flavago)*. 27th (one).—R. M. PRIDEAUX; Brasted Chart, Kent, June 16th, 1914.

## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 10th.—Mr. B. H. Smith, B.Sc., President, in the chair.—Mr. Ashdown exhibited Lepidoptera taken by him in June and July at Lugano and Zermatt, including *Ctenis æollo*, *Anthocharis simplonia*, *Aricia eumedon*, *Albulina pherestes*, *Syntomis phegea*, &c.—Mr. H. Main, larvæ of an *Acalaphus* just hatched, sitting with open jaws for prey.—Mr. Turner, *Agriades thetis* male with very dark under side and a male *Polyommatus icarus* with much intensified submarginal dark spots on the under side.—Mr. Edwards, exotic butterflies from S. America.—Mr. B. S. Williams, a black suffused *Manestra brassicæ*, and one with pale ground and aberrant stigmata.—Mr. Curwen, species of *Anthrocera* taken by him recently and suggested a future discussion on the genus.

September 24th.—Mr. B. H. Smith, B.Sc., President, in the chair.—Exhibition of lantern slides by Messrs. B. S. Williams and Dennis.—Mr. Newman, bred series of *Pieris napi* from Cork and Sligo, with yellow suffused and black suffused aberrations, one of the latter having a complete transverse black band on fore wings.—Mr. Brooks, varied series of *Polyommatus icarus* females from Horsley, Headley and Pickett's Hole.—Reports were made on the occurrence of *C. edusa*, *P. atalanta*, *P. cardui*, &c. Only stray specimens had been seen of *C. edusa*, while the other two species were common.—HY. J. TURNER, *Hon. Report. Sec.*

OBITUARY.—With very great regret we have to announce the death of Mr. WILLIAM WARREN, M.A., F.E.S., which occurred on October 18th last, after a short but painful illness. A further notice will appear in our next issue.

## RECENT LITERATURE.

*Études de Lépidoptérologie Comparée.* Fasc. ix. 1<sup>re</sup> et 2<sup>e</sup> Parties.  
Rennes. 1914.

THE last two published parts of M. Charles Oberthür's magnificent series of lepidopterological studies were published before the war broke out. Turning over the pages, and looking upon the plates by which they are illustrated, we may venture to hope that the Imprimerie Oberthür may find it possible to continue the work which for the past seven years has added so much to our knowledge of the lepidoptera of the world in general, and of France and Algeria in particular. For the author has opened his pages to various nationalities, having once intimated to the writer of this notice that he wished his own studies to be supplemented and enlarged by the observations of lepidopterists of all nations in the Old World and the New alike. These two parts, indeed, are chiefly concerned with the nearctic fauna, and in response to the request of American entomologists for an accurate account and determination of Boisduval's types, we are the richer by some fifty exquisitely coloured plates of North American butterflies designed from the originals, and hand-painted by M. J. Culot, of Geneva, whose work is familiar to students of the western palæarctic butterflies and moths. M. Oberthür, therefore, may also be congratulated upon having secured the assistance of that *rara avis*, an entomologist who is a first-rate artist, and an artist who is a first-rate entomologist. Part 2 further contains a *résumé* by Dr. Standfuss, of Zurich, of his breeding experiments with *Aglaia tau*, L., and, by the same author, a deeply interesting notice of morphological and physiological research in connection with two races of Spingid hybrids. British entomologists, to whom their names are household words, will also survey with pleasure the portraits of the several French, German, Swiss, and British authorities included in the "first series" of a gallery ending happily with a photograph of M. Oberthür himself—apparently the only one in existence. At their head is the renowned Dr. Boisduval, whose genial features smile out upon us from the past with convincing sincerity; then comes Dr. Gottlieb Herrich-Schaeffer and the eccentric Dr. Rambur, the discoverer of the process by which to-day we differentiate by the microscopic examination of the male appendages otherwise indistinguishable species; as, for example, many of the Hesperiidæ. British science of the old school is represented by the late Frederick Moore, D.Sc.; the new school of Swiss lepidopterists, if we may be permitted the term, by a characteristic picture of Dr. Jacques Louis Reverdin, successful follower in the special field already indicated by Rambur. These volumes are not, we believe, available for purchase, but M. Oberthür has presented copies to the Natural History Museum and to the Entomological Society of London, as well as to one or two privileged English friends. In the libraries of the institutions mentioned they are open to the use and inspection of investigators and collectors, who will gladly acknowledge their deep debt of gratitude to the generous donor.

H. R.-B.







T. A. Chapman photo.

AT LE LAUTERET. A HAUNT OF *P. THERSITES*.

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[No. 619

## SOME TASMANIAN BEES.

By T. D. A. COCKERELL.

I GIVE a list of the bees recently collected in Tasmania by Mr. F. M. Littler, and kindly forwarded to me by Mr. Walter W. Froggatt. Other specimens, with the same numbers, have been retained in Australia.

*Paracolletes marginatus*. Smith, 245 c (2331) and 244 c (2332). The scape is black in both sexes; in males from Victoria it is red. Bridport, Oct. 26th-30th, 1913.

*Paracolletes launcestonensis*, n. sp.

236 c. Launceston, Jan. 25th, 1914.

♀. Length about 8 mm.; head, thorax and legs black, the small joints of tarsi reddish; abdomen very dark greenish, the hind margins of first two segments appearing narrowly ferruginous, but at least at sides of first segment the colour is actually on extreme base of the one following; tegulæ and extreme base of anterior wings bright apricot colour; wings fuliginous, darkest in the costo-apical region; stigma large, black, nervures dark fuscous; flagellum wholly dark. Pubescence scanty; sides of face and cheeks with thin white hair; hair of vertex erect, pale, slightly brownish; clypeus shining, sparsely punctured; supraclypeal area duller, elevated, not punctured; front with a dull sericeous surface; anterior corners of mesothorax with a little pale ochreous hair (slight approach to condition of *humerosus* and *irroratus*); tubercles densely fringed with white hair; sides of metathorax with long white hair; mesothorax dullish, with sparse feeble punctures; postscutellum dull and rough, contrasting with the shining scutellum; area of metathorax large, bounded by an impressed line which is gently curved outward and is not beaded; scopa of hind tibiæ white, dark fuscous above basally; b. n. meeting t. m.; first r. n. joining second s. m. a little beyond middle, second joining third s. m. at apical corner; hair at apex of abdomen fuscous, not very abundant; under side of abdomen with curled white hairs. By the dark wings, this resembles *P. obscuripennis*, Ckll., but is easily separated by the tegulæ, metathorax, &c.

*Callomelitta littleri*, n. sp.

242 c (2324). Launceston, Jan. 25th, 1914.

♀. Length about 9 mm.; anterior wing 7·5. Similar to *C. picta*, Sm., but smaller; mesothorax, tubercles and axillæ terracotta red,

but pleura entirely black; tegulae bright apricot colour; anterior femora and tibiae bright red, but their tarsi dark; abdomen black, wholly without blue tints; wings very dark; area of metathorax with coarse ridges.

*Prosopis perhumilis*, Ckll., var. *a*.

240 c (2333). Bridport, Oct. 26th–30th, 1913. Two.

♂. Length about  $4\frac{1}{2}$  mm.; supraclypeal mark very small; at least half of hind basitarsi light.

*Parasphcodes rhodopterus*, n. sp.

243 c (2325). Launceston, Jan. 18th, 1914.

♀. Length about 8 mm.; rather robust; head, thorax, legs and antennae black, the last joint of flagellum very faintly reddish; tegulae rufotestaceous, dark at base; wings very strongly reddened, stigma and nervures dull red; abdomen chestnut-red, not very bright, first segment with a large black spot on basal middle, and a transverse very broad-triangular discal mark, segments beyond the third suffused with blackish. Clypeus with strong punctures; mesothorax and scutellum extremely densely and finely punctured; area of metathorax semilunar, with rather fine regular longitudinal ridges; posterior truncation without prominent upper corners; first r. n. joining the rather narrow second s. m. at apex; outer r. n. and t. c. thin but dark; hair on inner side of middle tarsi bright orange-ferruginous, but on inner side of hind tarsi paler; outer side of hind tibiae and basitarsi with fuscous hair; first two abdominal segments dull, with extremely fine punctures all over; third shining, with scattered irregular very fine punctures; third segment and beyond with fuscous hair, only clearly seen in side view.

Allied to *P. taluchis*, Sm., but flagellum and legs black.

*Parasphcodes rufotegularis*, n. sp.

235 c (2556). Launceston, Jan. 25th, 1914.

♂. Length 8.5 mm.; black, with the broad apical margin of first abdominal segment (extending basad at sides), and the second and third segments entirely, very bright ferruginous; labrum, mandibles and about apical half of clypeus (with an angular median projection into the black) light yellow; antennae very long, black; tegulae bright ferruginous; wings slightly dusky, nervures and stigma fuscous; knees, anterior tibiae (except a blackish mark on outer side), middle tibiae at apex, and all the tarsi, ferruginous. Head and thorax with greyish white hair; front dull; mesothorax and scutellum very finely punctured, the scutellum and posterior part of mesothorax shining; area of metathorax rather large, semilunar, glistening, with quite irregular rugae producing a subreticulate effect; first r. n. meeting second t. c.; abdomen with very fine punctures. This is too different from the last to be its male, the metathorax especially being quite different. There is some resemblance to *P. stuchila*, Sm., but that has the area of metathorax rugose-granular, and the tibiae ferruginous.

*Halictus cognatus*, Smith. 237 c (2323). Male. Launceston, Jan. 25th, 1914.

*H. lanarius*, Smith. 239 c (2335). Female. Devonport, Nov. 2nd-5th, 1913.

*Halictus hæmatopus*, n. sp. 238 c (2326). Launceston.

♂. Length about 6 mm.; black, with the tibiæ, tarsi and apical part of femora bright ferruginous, the middle tibiæ with a faint dusky stripe on outer side; labrum and mandibles dark, but clypeus with a broad pale yellow band, with an angular projection into the black above; antennæ black, the flagellum very long and crenulate; abdomen broad, finely punctured, without hair-bands or patches. Looks at first sight exactly like *H. sanguinipes*, Ckll., from Victoria, but differs as follows: abdomen comparatively broad at base, not claviform; tegulæ light orange-ferruginous; apical field of wings dusky. It is even closer to *H. bicingulatus*, Sm., differing by the wholly black flagellum, the large amount of black on femora, the longer stigma and the shining, more distinctly punctured abdomen. It could be regarded as an insular subspecies of *H. bicingulatus*. My male *bicingulatus* is from Brisbane; it is possible that specimens from the coast opposite Tasmania would more nearly approximate to the Tasmanian bee.

*Halictus littleri*, n. sp. 231 c. Launceston.

♀. Length about 8.5 mm.; black, including antennæ and tarsi; bands of greyish-white tomentum at bases of abdominal segments, reduced to a patch on each side of second; mesothorax very coarsely punctured; area of metathorax large, concave, finely striate; tegulæ piceous; wings dusky, second s. m. very large and broad. Close to *H. circumdatus*, Ckll., from Victoria, but differing thus: clypeus rough, more closely punctured, less shining; vertex and mesothorax with conspicuous black hair; middle of mesothorax more densely punctured; tegulæ much darker; wings greyer, not at all yellowish, with darker nervures; area of metathorax much duller, the striæ less regular; outer side of hind tibiæ with much black hair. The second abdominal segment is finely punctured, except the broad apical part, which is minutely lineolate, with only scattered rudimentary punctures; a useful character to separate the species from *H. gilesi*, Ckll., and *H. asperithorax*, Ckll. The front is microscopically grooved, the grooves crossed at intervals by ridges.

*Nomia submærens*, n. sp.

246 c (2334). Bridport, Oct. 26th-30th, 1913.

♀. Like *N. mærens*, Sm., but metathorax different, the transverse cross-striated channel much narrower in middle, its lower margin straight except at sides, where it rather abruptly bends upwards; wings shorter, nervures darker; tegulæ anteriorly with a pale marginal spot. This could be regarded as an insular subspecies of *N. mærens*.



*Exoneura hamulata*, Ckll., var. *a*.  
234 c. Launceston, Jan. 25th, 1914.

♀. With the broad face of *E. hamulata*; clypeal mark evanescent, all but the upper part dark reddish; wings strongly reddened, stigma clear amber; hair on outer side of hind tibiæ ferruginous. If the characters are constant, this will deserve a subspecific name. A specimen from Victoria has equally red wings.

I gave a list of Tasmanian bees in Proc. Linn. Soc. N. S. Wales, xxxvii., p. 599. Since that time the list has been considerably increased, so that with the present contribution it includes *Prosopis*, seven species; *Binghamiella*, one; *Euryglossa*, three; *Paracolletes*, ten; *Callomelitta*, two; *Halictus*, sixteen; *Parasphcodes*, thirteen; *Nomia*, one; *Megachile*, three; *Exoneura*, three. This is in striking contrast to the very poor bee-fauna of New Zealand; but while it seems certain that New Zealand cannot produce nearly as many bees as Tasmania, it remains probable that careful collecting would considerably augment the present short list. The large proportion of new forms collected by Mr. Littler shows that the Tasmanian bee-fauna is still quite insufficiently known.

### THREE WEEKS IN DAUPHINY.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(PLATE VII.)

(Concluded from p. 286.)

(ii.) *Le Lauteret*.

For three whole days, from July 21st to the 23rd, it continued to rain or snow upon the Col de Lauteret (6950 ft.), with scarcely an hour's intermission, by which time the lower valley of Oisans was under water, and half the country round Grenoble as well. The weather changed suddenly on the 24th, with a rude north wind, and though the skies above were clear, and the sun shone brightly, it was bitterly cold. Not until then was I able to collect, choosing the road up to the Col de Galibier as less exposed to the weather. The flowers, which at all events had suffered little from the severe drenching, were even more magnificent than at La Grave; and, at what seems a surprisingly late date for them, the white narcissus, *N. poeticus* var. *radiflorus*, was still in its first pride, together with the large white Anemone, *Anemone alpina*, and the handsome lofty *Orobis luteus*, which when going out of flower becomes deep orange. *A. simplicia* was now almost common. In the grass and herbage *Erebis pharte* again turned up in swarms, with tiny *E. ceto*, rare *E. epiphron* var. *cassiope*, and

rarer *E. melampus*. The late Mr. Tutt made interesting suggestions upon the specific identity of *E. pharte* and *E. melampus*, based to some extent upon the difficulty of separating the females. His remarks were published anterior to the systematic examination of the male appendages by later authorities, and though, as he says, the females of the two species are sometimes identically marked and even fly together, my experience here—and more markedly elsewhere in the Central Alps, and especially in the Tyrol—is that *pharte* is almost always *passé*, if not actually over, before *melampus* puts in an appearance.

But it seems probable that here, at all events, there is a tendency among what may be presumed the weaker species to associate with and mimic the strongest, viz. *Erebia pharte*, which at La Grave also is far and away the commonest of the small *Erebias*. Dr. Chapman, as stated (Proc. Ent. Soc. 1913, cxvii.-cix.), suspects a mimetic association at Le Lauteret; or in the alternative that climatic conditions may be responsible for this curious approximation of the three species to *pharte*. I did not take *pharte* last year at Larche; but there, too, *ceto* was of this diminutive Dauphiny form, and it flew apparently, for I was too late for the main emergence, over the ground where earlier I should have expected to meet with *pharte*, and did find *epiphron* and *melampus*. I see that Dr. Chapman hesitates to include *epiphron* in this association for want of material upon which to base his conclusions. But though rarer decidedly than the others, I find on looking through my captures that I also took the familiar "Mountain Ringlet" without realising its specific identity. Lastly, I may supplement these observations to add that the long series of *pharte* from La Grave and Le Lauteret differ *inter se*. The females are quite as brilliant in the depth of the orange fascia as examples from Brenner and the Tre Croce, Cortina. The rusty markings on the upper side of the male fore wings vary from a single small spot, towards the apical angle, to well-defined series of blotches, constituting a more or less continuous band. Of the *epiphron*, some are much nearer type than var. *cassiope*. The furious wind which never ceased to blow even when it was fine at Le Lauteret made expeditions hopeless to the higher mountains in search of butterflies. A friend who struggled up the Grand Galibier informed me that near the summit on the rocks he had seen some "all-black" butterflies battling with the tempest—and these no doubt would be *Erebia alecto*, this being the actual spot whence Boisduval, more than half a century ago, received his first (?) French examples.

Among the small fry on the Galibier route *P. eros* was the commonest of the "Blues," with *P. pheretes* males much injured by the buffeting of the past few days. Again I saw no *P. icarus*, but *P. thersites* afforded males, and a few lovely blue

females, the majority of which latter unfortunately fell victims to the *mobilisation générale*. *P. orbitulus* was hardly out. *H. alveus* and *H. serratulae* were fairly common; *H. carlinæ* were represented by individual males.

On the 26th in the afternoon, after two sunny days, I did not see a single butterfly. At about 8000 ft. it was sleeting miserably. The day before, encouraged by a clear blue sky, and the apparent distance of the mountains dazzling with new fallen snow, I trudged off to the Club Alpine (6955 ft.) on the Lauteret side of the Col d'Arsine. The path leads up parallel for some distance with the road to La Grave through pastures of peerless beauty, knee-deep in columbines, campanulas, and white anemones, reminiscent of MacWhirter's masterpiece in the Tate Gallery, "June in the Austrian Tyrol." A fine butterfly ground in calmer weather; but, alas! to-day the wind shrilled higher than ever, effectually keeping everything level with the herbage. Out of the wind in a deep gully turning up the last of the valley of the Romanche I watched *Parnassius delius* flying over the saxifrage, and every now and again the favoured yellow crucifer would be visited by *A. simplonia*. Once over the brim of the hill they disappeared before the wind like magic. A secluded meadow near at hand afforded covert to a rather faded race of *Melitæa aurinia* var. *merope*; and here *P. argus*, *C. hippothoe* var. *eurybia*, and *P. hylas* were flitting with *Cænonympha iphis*, *P. medon*, and the usual host of small Erebias. But once beyond this shelter and on to the Refuge Hut there was nothing except an occasional *Argynnis niobe*, and swarms of *Anthrocera exulans*. Careful search for *H. andromedæ* was unrewarded, but I have little doubt than in less boisterous weather I should have repeated the successes of La Grave. Near the Hut there is an abundance of *Dryas octopetala*. On the 28th, despairing of an improvement, I left reluctantly for Monétier-les-Bains, where I found comfortable quarters and homely comforts with many agreeable French visitors at the Hotel de l'Europe, kept by M. Izoard, a famous Dauphiny guide of his day, and a veteran of "Soixante-dix."

### (iii.) Monétier-les-Bains.

As I walked down, back to the wind, from Le Lauteret on another day, blustering and cold as March, visions of *Erebia scipio* at warmer Monétier rose before my eyes. A single specimen on the Col de Larche last year—the sum total of five separate years' hunt—had scarcely satisfied my appetite for the chase. Dr. Reverdin had informed me of its existence in quantities at Monétier; Mrs. Nicholl, that indefatigable pioneer of British collectors in Spain, in Bosnia, in the Balkans, and in Dauphiny, had advised me of its presence at Vallouise, no great distance away as the crow flies. When just a quarter of an



hour outside the village I saw a greyish-looking *erebia* tumbled over and over in the dust by the sweeping wind, my hopes were raised proportionately. The wind caught my hat and carried it well on towards Monétier, but I had the butterfly in my net and it was, as I expected, a female *E. scipio*, yet so much the worse for the escapade that I let her go at once. Then I made a valiant attempt to swarm to the little plateau whence possibly she had descended, and where I spotted two or three male *Erebas* disporting themselves. I could not get near them, so wild were they; and I never saw the species again, though three times I returned under less adverse circumstances. *Scipio*, therefore, remains on my list of *desiderata*, and, with all the world at war, I wonder whether I shall ever supplement in my cabinet the Digne examples kindly given me by M. Oberthür with those of my own capture.

The village of Monétier lies at the south end of a bleak open valley extending almost the whole way from Pont de l'Alpe—looked at from above, a grey-brown wilderness of dusty fields, the detritus of the Guisane, which river, it would seem, habitually inundates the surrounding country when the snows of Le Lauteret melt. But if the main valley is unpromising from an entomological point of view, the lateral valleys opening up consecutively on either side, but principally on the right bank, suggest fat bags for those who do not mind a certain amount of rough-and-tumble walking *en route*, made more laborious this season by the frequent rain rupture of the pathways. The tempestuous weather had also left its mark on the butterflies hereabouts. At all events, species reported as common by Mr. Tetley were hardly to be seen at all; and even where the mountain pastures were smiling with flowers and lush-green grass, I did not find that abundance of common things which is a feature of most Alpine pleasaunces. The four days of my collecting were divided between the hills and mountains on either side of Monétier. Those to the east were most productive at the lower levels; but very little was to be seen above the tree-line, and it was in the openings of the fir woods here that I first found Anthrocerids really plentiful, *A. achilleæ* sharing claim with *A. transalpina* and *A. loniceræ* to be commonest of their genus. The *A. carniolica* from this locality are characteristic—small in size, the spots without marginal decoration, and the colour rather pale crimson. I boxed no more than a single specimen of *A. fausta* this year, on the Lauteret road.

Where the Burnets were most plentiful they shared the flower heads of scabious and yellow hawkweeds with clouds of *Adopæa lineola*, *P. corydon*, *P. hylas*, and occasional *P. thersites*. *Brenthis ino* was also in great force, with a small race of *M. phœbe*. *Papilio machaon* and some *Aporia crategi*, *P. apollo*, and *C. phicomone* were fairly well represented. The *Erebas*



seen here were *E. stygne* and *E. euryale*, both *passés*; the Hesperids *P. sao*, *H. alveus*, and, among the very few things flying on the close-grazed, wind-swept clayey tops, *H. carlinæ*. I can recall no Satyrids of the larger kind on the wing except *S. cordulea*; and this was infrequent except on the hot hillside, where I had sought *Erebia scipio* in vain. *Chrysophanus virgaurea*, too, was not as common as usual; the females taken are intermediate in colour between the type and var. *zermattenis*. This pathway winds up to one of the well sources from which Monétier draws its thermal waters. The forester's hut marks a convenient centre for the chase, and had not the Fates ruled otherwise, I should have extended my explorations considerably in this direction.

It is a curious fact that until I wended my way towards the Col d'Arsine on July 29th I had not observed a single Theclid in France this year. The few *T. ilicis* left on the *Millefolium* had seen their last days, and it was the same with most other species on the wing—very difficult to secure good specimens. In the lower forest *B. amathusia*, *B. ino*, and *Limenitis camilla* occurred, the first-mentioned commonly; but it was disappointing to plod miles under the burning sun and find so few species besides on the wing. Even *Argynnis niobe* was rare, *A. aglaia* more so; and at the higher levels towards the summit of the Col (7874 ft.), on the steep slopes above the little Lac d'Arsine, there were surprisingly few butterflies, though the day was perfect. Mr. Tetley had bid me look for *E. scipio* here; I saw none—only *E. stygne*—and compared with the locality at Monétier it seemed a less likely spot and elevation for the species. *B. pales*, generally swarming, was represented by single individuals; *A. simplonia* rather common, but wild and wary. By the brooks *P. delius* floated temptingly, and I took one beautiful female. *E. tyndarus* and *E. lappona* were battered and broken; no sign of *H. andromedæ*, but again several exquisitely fresh *H. carlinæ* and imperfect *H. serratulæ*, all of which repeated themselves, only even more rarely, on the high valley below the Monétier Glacier, where I spent the last day of my holiday on the flowery slopes.

Sunday, August 2nd, 1914, is not likely to be forgotten by France for many years to come; it will remain indelibly fixed on my memory as long as I live. The long summer day waning to its close, a perfect peace brooding over the hills, made musical by the thousand bells of upland-pastured sheep. I had reached the hotel about 5 o'clock, and was making tea in my little bedroom when suddenly I heard the tocsin begin to ring. Thinking at once that there was a fire, I slipped on my boots again, and ran out into the little square just in time to hear the Mayor read out the fateful order for the general mobilisation of the French armies. A conflagration indeed! War! And by midnight

not an able-bodied man, not a horse, cart, or mule was left in Monétier. The tide of Destiny had swept even into this tiny haven of peace, and borne away silent and unprotesting—nay, I think, glad with a sober joy—the brave peasants who, for a second time in history, stand side by side with our people on the red battlefields of France and Belgium.

Butterflies observed at La Grave, Le Lauteret, and Monétier-les-Bains, July 11th–August 2nd, 1914:—

**HESPERIIDÆ.**—*Carcharodus luratæ* (one, La Grave), *C. althææ*; *Augiades sylvanus*, *A. comma*; *Adopæa lineola*; *Hesperia alveus*, *H. carlinæ*, *H. serratulæ*, *H. cacaliæ*, *H. andromedæ*, *H. malvoides*; *Pyrgus sao*.

**LYCÆNIDÆ.**—*Chrysophanus hippothoë* var. *eurybia*, *C. dorilis* var. *subalpina*, *C. virgaureæ*, *C. phlæas*; *Lycæna arion* (going over); *Nomiades semiargus*; *Cupido minimus*; *Polyommatus eumedon*, *P. donzellii* (one, La Grave), *P. damon*, *P. corydon*, *P. hylas*, *P. escheri*, *P. thersites*, *P. icarus*, *P. eros*, *P. orbitulus*, *P. medon*, *P. pheretes*; *Plebeius argus*; *Thecla ilicis* (Monétier). (Included in Dr. Chapman's list, but not met with by me, *Cupido sebrus*.)

**PAPILIONIDÆ.**—*Papilio machaon*, *P. podalirius* (near Bourg d'Oisans, July 11th); *Parnassius apollo*, *P. delius*.

**PIERIDÆ.**—*Aporia crategi*; *Pieris brassicæ*, *P. rapæ*, *P. napi* var. *bryoniæ*; *Pontia callidice*; *Anthocharis simplonia*; *Euchloë cardamines*; *Leptosia sinapis*; *Colias phicomone*, *C. hyalæ*, *C. edusa*; *Gonepteryx rhamni*.

**NYMPHALIDÆ.**—*Argynnis aglaia*, *A. niobe*, and var. *eris*; *Issoria lathonia*; *Brenthis euphrosyne*, *B. ino*, *B. amathusia* (Monétier), *B. dia*, *B. pales*; *Melitæa aurinia* var. *merope*, *M. phœbe*, *M. didyma*, *M. varia*, *M. athalia*, *M. dictynna*; *Pyrameis cardui*, *P. atalanta*; *Aglais urticæ*; *Limenitis camilla* (Monétier).

**SATYRIDÆ.**—*Pararge mæra*, *P. megæra*; *Epinephele jurtina*, *E. lycaon* (Monétier); *Cænonympha iphis*, *C. satyrion*, *C. pamphilus*; *Erebia epiphron* var. *cassiope*, *E. melampus*, *E. pharte*, *E. mnestra* (Evariste-Chancel), *E. alecto* var. *duponcheli*, *E. ceto*, *E. stygæ*, *E. scipio*, *E. euryalæ*, *E. goante*, *E. gorge*, *E. tyndarus*, *E. lappona*; *Melanargia galatæa*; eighty-nine species in all.

Harrow Weald: October, 1914.

## ACRONYCTA STRIGOSA, HADENA ATRIPLICIS, &c., IN CAMBRIDGESHIRE.

By A. THURNALL.

As a native of South Cambridgeshire the various notes which have appeared in recent numbers of the "Entomologist"

naturally appeal to me, so possibly my own rather small experience with *Acronycta strigosa* nearly forty years ago may be interesting to present-day collectors. In the years 1873, 1874, 1875 I was living in the village of Whittlesford, about sixteen miles south of Wicken, and like most young entomological enthusiasts the Noctue were my especial favourites. In those distant days I used to sugar the trees in the garden and adjoining orchard almost all the year round and met with many species considered "real good things" at that period. The first specimen I ever took (of *strigosa*) was as far back as 1870, flying in the garden in the dusk; in 1873 two more at sugar in the same place. In the following year I took four: one at light, two at sugar in the orchard, and one at rest on the lichen-covered trunk of a small hawthorn tree growing in a hedge skirting a field in the neighbouring parish of Duxford, in the extreme south of the county. In 1875 I also took four: two at sugar and two at rest on the same small hawthorn tree above-mentioned. I left the district in that year and had very few chances of working for this moth afterwards, but on August 4th, 1879 (an unusually late date surely!), I took a female in beautiful condition in the garden at sugar, and the following month I beat a single full-fed larva from a hedge near the house: I never saw *strigosa* alive in any stage afterwards. With regard to its occurrence in Wicken Fen itself, I believe it has been taken, but very rarely. My old friend, Frederick Bond, told me he only found one (at sugar) in the Fen, but he took it in some numbers in some fields at the back of Fulbourn Asylum, and amongst them one or two "black ones." Whether this melanic form has been taken in recent times I am unable to say. Mr. Bond's captures were made, I think, in the late fifties of the last century. From the fact that it has been taken in the Chatteris, Wicken and Whittlesford districts it would seem that it is (or was) found throughout the county. Although always associated with Cambridgeshire, some of your readers will perhaps be surprised to learn that it has been taken as far away as Worcestershire. Mr. Dobree Fox, a good entomologist, in the eleventh volume of the "Entomologist" (p. 252), records the capture of two at sugar in his own garden in 1878. Another insect usually associated with the fens, *Cidaria sagittata*, has also been taken away in the West of England, in Bewdley Forest, Worcestershire. "Seven fine specimens flying over a swampy place at dusk" (W. Edwards, Entom. xvi. 211). Again, another species, the beautiful little *Commophila schreibersiana* turned up quite recently in Gloucestershire. With regard to *Hadena atriplicis* I used to take it not uncommonly, together with *Palimpsestes ocularis*, at sugar on the trunks of some large poplars on the Waterbeach side of Upware. The latter I bred several times from pupæ found at the foot of some Lombardy poplars at Sawston, in the south of the county.



As a supplement to the above note, I may mention the fact that *H. atriplicis* was formerly quite a common moth round Wicken: one good spot was a plantation close to the village itself. Mr. Bond told me that on one occasion he had been on the Fen all the evening, returning to the well-known 'Five Miles' Inn about midnight, very tired; it being a very warm night he opened the windows, placed a light near them and went off to sleep; awaking when it was broad daylight he found *Noctuæ* sticking "all about the walls and ceiling, most of them *atriplicis*." From a female taken at sugar June 11th, 1877, I obtained three eggs and succeeded in rearing one imago which emerged on June 15th, the following year; I fed the larva on knotgrass. It was in this latter year that I last saw the long extinct *Lælia cænosa*. On August 6th I took a male and Albert Houghton another, flying, or rather "fluttering," with their characteristically soft flight up and down the glass sides of the lamp. Messrs. Porritt and Daltry took the very last (recorded) specimens, I believe, in the following year (Entom. xi. 229).

Wanstead: November 10th, 1914.

## AN EXPEDITION IN SEARCH OF RUSSIAN BUTTERFLIES.

By W. G. SHELDON, F.E.S.

(Concluded from p. 297.)

*Hipparchia semele*.—First seen on June 6th, and shortly afterwards became abundant everywhere.

*Pararge climene*.—This species, which is not known to extend further west than the Carpathians, and which is rare in the one or two localities in which it is found in those mountains, occurs in the utmost profusion at Sarepta; I saw, but did not capture, a single example on May 31st in a cross valley in the hills some four miles north-west of the town. At the same spot, when next I visited it on June 5th, *P. climene* was flying in profusion; on this day only males were seen. The next day they were almost equally abundant in the "Tschapurnik Wald," and we afterwards found them in every spot in which there was any quantity of wood. The first females were seen on June 11th. This butterfly frequents the outskirts of woods; the male has a very *epinephele*-like flight, and on the wing closely resembles *E. jurtina*. It is continuously hovering over and searching amongst bushes for the females. These latter are not easy to find or secure; they seem, one presumes, after pairing to hide away from the males, and are to be kicked up out of small clumps of bushes some distance away from the larger woods that the males frequent. I did not see a single female flying naturally; probably they would fly late in the day, when I was never on the ground. When disturbed they would, if not netted, quickly settle again in the thickest part of a



bush. All my females, about a dozen in number, were secured in these spots, with the exception of a couple that were found *in cop.* one morning about 10 a.m. Both sexes get worn very quickly, and are only fit for cabinet specimens for a very few days after emergence.

*P. macra*.—I saw but did not capture this species at Novorossisk.

*P. megera*.—Common at Ialta and Novorossisk, but not seen at Sarepta. The Ialta specimens are very bright and richly coloured; those from Novorossisk are not so bright as typical examples.

*P. egeria* var. *egerides*.—Only seen at Ialta; one or two specimens.

*Epinephale lycaon*.—First seen at Sarepta on May 25th; afterwards it became common generally; the form is the fine one known as var. *intermedia*, which is described and figured by Seitz.

*Coenonympha leander*.—This eastern species we found abundant in the "Tschapurnik Wald" on May 22nd; many of the males were on that day past their best, and the females were well out. In its appearance and habits it is very similar to its Spanish representative *C. iphoides*, except that it seems to frequent bushy slopes, whereas *C. iphoides* is usually, but not always, a marsh-loving species. Although *C. leander* was common in the "Tschapurnik Wald," we did not see it elsewhere.

*C. arcania*.—Very typical examples of this species were common, in the same locality as the last only, from May 22nd onwards.

*C. pamphilus*.—Seen in all districts worked, but not commonly; the examples are in all cases very typical.

*Carcardodius alceae*.—Not uncommon at Novorossisk and Sarepta.

*Pyrgus proto*.—A larva found freely on *Phlomis herba-venti*, both at Novorossisk and Sarepta, produced this species after my return to England. The specimens are less ochreous than those I have from Spain.

*P. orbifer*.—Not uncommon at Ialta, and one example was taken by me at Novorossisk.

*Hesperia carthami* var. *moeschleri*.—Common on dry hills at Sarepta at the date of our arrival.

*H. armoricanus*.—A few specimens of a Hesperid were taken at all three localities, which an examination of the genitalia proves to be this species. There are certain divergences from western *H. armoricanus* apparent in these organs, but Dr. Chapman, who has examined the preparations, does not consider them sufficient to indicate a distinct species.

*H. cribrellum*.—On May 29th I captured two examples of this species in a valley in the main range of hills, about two miles south-east of Sarepta; they were taken within a few yards of each other. On the following day I netted on the same spot a third example; but though I afterwards frequently searched both this and many other similar localities, these three specimens were the only ones we saw; they are small examples, not exceeding 36 mm. in expanse.

*H. tessellum*.—This fine eastern species was first seen on May 27th; afterwards it became somewhat common, but it was local and difficult to capture. Many of the specimens are large. I have it up to 46 mm. expanse. Its headquarters was undoubtedly in the valleys in the hills some miles north-west of Sarepta; it was here to be seen in some numbers, flying wildly, and being difficult to follow with the

eye in its swift flight; from time to time the butterfly would settle upon flowers, but even then a capture was difficult to effect, for it would usually fly up when one was some yards distant.

*H. sidae*.—Common in the same localities as the last species, and of similar habits. Some of the examples are very large; I have one that expands 45 mm., as against 39 mm., the expanse of the largest of my southern French specimens. The Sarepta form is also more brightly marked, both on the upper and lower surfaces; first seen on May 28th.

*H. malvae*.—A few specimens were seen at all localities, of what I presume is this species; unfortunately, neither Mr. Jones nor myself brought back a male, so we cannot be quite certain.

*Nisoniades tages*.—Not uncommon at Ialta and Novorossisk, a very typical form.

*Angiades sylvanus*.—Common in woods at Sarepta from May 21st.

*Adopaea flava*.—Common at Sarepta; a fine richly-coloured form, expanding up to 40 mm.; first seen on June 6th.

*A. lineola*.—Abundant in the same localities as the last species, from May 31st.

The Heterocera of Sarepta were most interesting and abundant, and it was a matter of keen regret to both Mr. Jones and myself that we were not able to work at them more thoroughly; but this would have entailed a certain amount of night collecting, and one cannot very well keep fit if both day and night work is undertaken, especially when, as in our case, you are on the wrong side of a certain age.

Perhaps the most striking moth we saw was the exquisite *Macroglossa croatica*, which although not common, was not infrequent in June; it seems probable that it can fly rapidly, but those I saw, all of which were captured, were slowly threading their way amongst the herbage; the larva is said to feed upon *Centaurea*.

Zygænidæ were very rare; a few examples of what I suppose is *Procris globulariae* were taken at Sarepta and Novorossisk, and at the former locality *Syntomis phegea* was seen not rarely.

The larvæ of *Malacosoma castrensis* were abundant amongst *Artemisia*, sp.

The beautiful *Cucullia argentina* was not infrequent at rest on the stems of dead plants, and was exceedingly well protected by its resemblance to them. *Heliothis scutosa* swarmed everywhere, and *H. dipsaceus* was equally abundant. I bred an example of this species from a larva found feeding upon the flowers of a *Salvia*, which resembled and might be *S. pratensis*.

*H. peltigera* and the beautiful *H. incarnata* both occurred, and *Acontia lucida* and *A. titania* were common; a handsome larva found upon a species of *Linaria* produced *Calophasia casta*.

*Micra paula* was not infrequently taken; probably it was abundant, but of course its small size made it very inconspicuous. *M. parallela* and the beautiful *M. purpurina* occurred.

Amongst the Plusias I have brought away examples of *P. ni* and *P. gutta*, and the ubiquitous *P. gamma* swarmed.

*Emmelia trabealis* was abundant and generally distributed, and everywhere in swamps.

*Erastia argentula* was abundant.

The eastern species *Euclydia triquetra* flew in the sun not infrequently on the banks of the railway. Single specimens of *Agrotis ravida*, *Xylina scripturosa*, *Cucullia xeranthemi*, and *Scotogramma stigmosa* came to light in our rooms.

Amongst the Geometræ *Euchloris volgaria*, the eastern representative of *E. smaragdaria* was common; its food-plant is undoubtedly *Artemisia*, on one species of which I saw females depositing ova in the daytime. Perhaps the most striking geometer we saw was the very handsome *Aspilates mundataria*, which was abundant everywhere; equally common, but very local, and only seen on the hills towards Tsaritsyn, was the delicate *Siona nubilaria* var. *exalbata*; and with it, and superficially closely resembling it, were large numbers of *Scoria dealbata*. One of the most abundant species was *Lythria purpuraria*, which occurred in the type form, and also as var. *lutearia*; amongst the Acidalias, *A. similata*, *A. sericeata*, *A. subtilata*, and *A. marginepunctata* were taken. Other species observed included *Rhodostrophia vibicaria*, *R. iacularia*, *Boarmia consortaria*, *Ematurga atomaria*, a remarkably light form, *Phasiane glariaria*, *Eubolia arenaccaria*, *Fidonia murinaria* and *Scotosia rhamnata*.

The Pyralidæ were in enormous number as examples, but apparently they consisted of but very few species. Quite the most abundant of the group was *Phlyctaenodes sticticalis*, which swarmed everywhere; other species were *P. sulphuralis*, *P. verticalis*, *P. clathralis* and *Cledeobia connectalis*.

In the above list of Heterocera it is notable that almost half of them have been reported as having been found in Britain, which is a surprising proportion, considering the distance apart that the localities are, and the difference in climate that obtains. Still more notable, however, is the fact that out of the species that are on the British list about a dozen are our most local natives, or casual visitors; and point to the fact that the reason they are rare or local with us is that our country is on the extreme verge of their areas of distribution. Amongst the Micros very little could be turned up at Sarepta. The whole terrain swarmed with them; but with the exception of two or three species of Tineæ only odd specimens could be found. Single examples of one species were all I could get amongst the Crambidae and Pterophori: and of the great Tortrix group less than half-a-dozen individuals were seen.

The following is a list of some specimens brought home, which Mr. J. H. Durant has kindly named:—*Euxanthia hamana*, *Cydia splendana*, *Plutella maculipennis*, *Pleurota pyropella*, *Coleophora vibicigella*, *Brachodes appendiculata* and *Tinea misella*.

## NEW SPECIES OF HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### SYNTOMIDÆ.

#### *Amata nigrifrons*, sp. n.

♀. Head and thorax black, the latter spotted with orange beneath; abdomen black with five orange bands, the first (basal)

broad, the second and third narrow and near together, the fourth narrow and close to the fifth, which is broad and completely girdles the abdomen. Fore wings black with bluish sheen; hyaline spots nine in number, placed as follows: one subbasal, almost round; three median, the central one small; five postmedial, the central one minute. Hind wings black with bluish sheen; two hyaline spots each traversed by a black vein, that nearest base tinged with orange on the dorsal area. Under side agrees with the upper side, but the dorsum is more orange.

Expanse, 48 millim.

Collection number, 1867.

One female specimen from Karapin (3000 ft.), June, 1908.

Comes nearest to *A. dichotoma*, Leech.

#### NOCTUIDÆ.

##### *Metæmene hampsoni*, sp. n.

♂. Head, thorax, and abdomen pale brown. Fore wings pale brown; antemedial and postmedial lines indicated by series of black dots, the first inwardly oblique and the second strongly excurved; discoidal dot black; costa beyond postmedial line whitish dotted with black; fringes whitish dotted with black at apex, middle, and tornus, and preceded by a series of smaller black dots. Hind wings fuscous, dorsal area paler, a black dot at tornus; terminal dots black, fringes pale brown. Under side fuscous; fore wings without transverse series of black dots; hind wings with black discoidal dot and curved line beyond.

Expanse, ♂, 20 millim.; ♀, 28 millim.

Collection number, 679.

A male specimen from Kanshirei (1000 ft.), April 16th, 1906; and a female from Arizan (7300 ft.), August 18th, 1908.

##### *Parallelia takaoensis*, sp. n.

♀. Head brownish, thorax brownish slightly mixed with grey, abdomen brownish grey. Fore wings pale grey, violet tinged, clouded with brownish grey; subbasal line blackish, outwardly pale edged, not extending below median nervule; antemedial line blackish, slightly oblique; postmedial line blackish, outwardly oblique from costa to vein 7 where it is sharply angled, thence slightly incurved to dorsum, broadly shaded on each side with brown; subterminal line pale, bluntly serrate, on apical area somewhat obscured by a short black indented line from apex. Hind wings fuscous grey, traces of pale medial and postmedial lines. Under side grey suffused with fuscous, except on termen of all the wings; a dusky, almost straight, medial line and a pale subterminal line on fore wings; a dusky discoidal dot and two curved and wavy lines beyond, also a pale wavy subterminal line on hind wings.

Expanse, 42 millim.

Collection number, 167A.

A female specimen from Takao, August 22nd, 1904.



In marking, this species closely approaches *P. renalis*, Hampson.

*Thermesia arizanensis*, sp. n.

♂. Head and collar dark brown, thorax pale brown; abdomen pale brown mixed with dark brown except at basal and anal ends. Fore wings pale brown finely sprinkled with black atoms, costa blackish towards base; two black dots in cell and a fainter one at base of the wing in line with them; antemedial line represented by a dark oblique streak from dorsum to first cell dot; postmedial line black, outwardly edged with white and inwardly dark shaded, oblique, sharply angled and incurved before costa, the dark shading continued to apex; terminal area clouded with darker brown; subterminal line pale, wavy, indistinct; terminal dots black, between veins. Hind wings pale brown; discoidal spot and medial line black, the latter, which appears to be a broad continuation of the postmedial on fore wings, is outwardly edged with white and inwardly dark shaded; terminal area traversed by two parallel dark bands; terminal dots black, between veins. Under side pale ochreous brown, finely powdered with blackish; fore wings have two black dots on the cell and two blackish oblique lines beyond; hind wings have a black discoidal spot and an interrupted sinuous band beyond.

Expanse, 40 millim.

Collection number, 1026A.

Two male specimens from Arizan (7300 ft.), August, 1908. There are two male specimens in the British Museum from Arizan (Wileman). These agree in almost every particular with the type, but in the other male retained in my collection the postmedial line of fore wings and the medial line of hind wings are broadly bordered outwardly with blackish.

*Thermesia kanshireiensis*, sp. n.

♂. Similar to *T. arizanensis*, but smaller; the antemedial line of fore wings is rather more oblique, the postmedial line is not white edged, and the subterminal line is brownish dotted with black on dorsal half. On the under side the transverse lines of fore wings are closer together; on the hind wings the medial band is less sinuous and is preceded and followed by other dusky bands.

♀. Larger, somewhat paler in colour, and the markings less distinct.

Expanse, ♂, 36 millim.; ♀, 40 millim.

Collection number, 1026.

One example of each sex from Kanshirei, June 13th, 1906 (male), April 15th, 1906 (female). There is also a female specimen from Kanshirei (Wileman) in the British Museum.

*Thermesia bifasciata*, sp. n.

♂. Head and thorax pale brown; abdomen pale grey, almost whitish. Fore wings pale brown lightly flecked with black; a black dot below median nervure and one above it in the cell; medial line

inwardly oblique, dark brown from the costa to cell, thence black outwardly shaded with dark brown to dorsum; postmedial line pale ochreous, narrowly edged inwardly with dark brown and outwardly bordered by a strong black line and brown shading, gently incurved from apex to dorsum near tornus; subterminal line pale brown, almost straight, traversing brown shading of postmedial line; terminal line black; fringes pale brown, marked with darker. Hind wings pale brown transversely shaded with darker on basal two-thirds; terminal third darker brown transversely divided by a streak of the ground colour; terminal dots and fringes as on the fore wings. Under side pale brown; fore wings suffused with darker brown on the disc; hind wings freckled with darker brown, especially on costal area, discoidal dot black; all the wings have a dusky postmedial line and black points on termen.

♀. Similar, but rather darker in general colour; the medial line on fore wings is brown throughout, the black outer edging of the postmedial line is very slender, and the subterminal line is indistinct.

Expanse, ♂, 42 millim.; ♀, 40 millim.

Collection number, 1025.

A male specimen from Arizan (7500 ft.), September 21st, 1906, and a female from Kanshirei, October 12th, 1908. There is one specimen from Formosa (Wileman) in the British Museum.

#### LASIOCAMPIDÆ.

##### *Cosmotriche discincta*, sp. n.

♂. Head brown; thorax grey, white dotted behind, collar brown mixed; abdomen brown. Fore wings grey suffused with brown on the disc; antemedial line black, tridentate, inwardly edged with white; postmedial line black, wavy, elbowed at vein 6, terminating about middle of the dorsum where it is outwardly edged with white, black extending along the dorsum to antemedial line; discoidal spot white, dark margined; subterminal line black, undulated, not clearly defined about middle; fringes white chequered with black. Hind wings brown, discoidal mark and angled medial line dusky, fringes white chequered with black. Under side brown, area of all wings, inside the blackish angled line, suffused with dark fuscous; fringes as on upper side.

Expanse, 42 millim.

Collection number, 1796.

One male specimen from Rantaizan, May, 1909.

Allied to *C. lobulina*, Denis.

#### LYMANTRIIDÆ.

##### *Euproctis purpureofasciata*, sp. n.

♂. Head and thorax yellow, antennæ bipectinated. Fore wings yellow, clouded with purplish and sprinkled with black on basal area. medial fascia purplish, sprinkled with black, irregularly edged, con-

stricted below middle: subterminal line purplish, interrupted above and below middle. Hind wings white. Under side white; fore wings tinged with yellow, purplish band of upper side showing on costal area only.

Expanse, 33 millim.

Collection numbers, 1251 and 1252.

Two male specimens; one from Arizan (7300 ft.), August 21st, 1908, and the other from Rantaizan, May 12th, 1909.

*Euproctis diplaga*, Hampson.\*

♀. Fore wings whitish powdered with dull grey, tinged with ochreous on outer area; the black apical marks are larger than in the male, and the postmedial lines more in evidence and distinctly serrate below the cell. Hind wings fuscous.

Expanse, 26 millim.

Collection number, 1411.

A female specimen from Kanshirei, June 19th, 1908.

Only the male of *E. diplaga* has been previously described.

CYMATOPHORIDÆ.

*Polyplocia albibasis*, sp. n.

♂. Head and collar blackish grey, thorax pale grey, mixed with darker; abdomen grey. Fore wings pale smoky grey; three patches of white on costal area—one at base, one between antemedial and postmedial lines, and one at apex; subbasal line black, indented below costa; antemedial band brown tinged, outlined and traversed by black lines; postmedial band brown tinged, inwardly edged by a black sinuous line and outwardly by a bluntly serrate line; orbicular stigma white, outlined in black; subterminal and terminal lines black, wavy, approximate near apex, the subterminal with three black dots on dorsal half; fringes pale grey, basal half darker, marked with black at ends of the veins. Hind wings fuscous, paler on the dorsal and basal areas. Under side fuscous, terminal area of the wings darker beyond a pale transverse line; costa of fore wings white, marked with black on outer half.

Expanse, 38 millim.

Type in the British Museum. Arizan, March 23rd (Wileman). Allied to *P. orbicularis*, Moore.

NOTODONTIDÆ.

*Pydna kanshireiensis*, sp. n.

♂. Head brown, antennæ fasciculate; thorax pale brown mixed with darker in front, darker brown behind; abdomen dark brown, paler below and towards anal segment above. Fore wings pale brown, clouded and streaked with darker; subbasal line indicated by two black dots, one just below costa and one under median nervure; antemedial line black, wavy, indistinct, followed by a black diffuse

\* Journ. Bomb. Nat. Hist. Soc. xx. p. 113 (1910).

mark in the cell; an oblique dark streak from cell mark to the dorsum near base; a dark central shade, elbowed below costa; post-medial line brown dotted with black on the veins, preceded by a series of brown dots between the veins; terminal dots black, inwardly edged with white, placed between the veins, space between veins 3 and 4 tinged with reddish, and a short white streak projects inward from the black dot in this space. Hind wings dark fuscous, fringes whitish partly chequered with dark fuscous. Under side whitish brown; fore wings clouded with fuscous on the disc; hind wings clouded with fuscous, two curved, and somewhat wavy, dusky transverse lines.

Expanse, 48 millim.

Collection number, 1231.

Six male specimens from Kanshirei. One, September, 1907; three, May, 1908, and two, July, 1908.

One specimen, also from Kanshirei (Wileman), in the British Museum, is slightly darker in colour than either of the examples retained in my series. Very close to *P. albistriga*, Moore.

*Liparopsis formosana*, sp. n.

♂. Head and thorax brownish grey, collar whitish. Fore wings whitish grey, finely powdered with dark grey; basal area brownish grey mixed with black at base of the wing, limited by an oblique darker line; postmedial line indicated by black edged white dots on the veins; terminal area brownish grey except towards the costa; terminal line black. Hind wings whitish powdered with dark grey on costal area, some brownish hairs on the costal half, a black dot on costa before apex. Under side whitish, disc of fore wings suffused with fuscous.

Expanse, 36 millim.

Collection number, 744

A male specimen from Kanshirei, September, 1908.

NOTES AND OBSERVATIONS.

EUROIS OCCULTA IN ESSEX.—I am glad to be able to record the occurrence of this fine moth in Essex. Four specimens were taken at sugar on July 30th, 1914, in a wood not far from here by my friends Messrs. J. F. Johnstone and C. Cork. They are all of the dark form var. *passetii*. I am not aware of any previous record of this moth having been taken in Essex, and it does not seem to have been recorded at all recently from the southern half of England.—(Rev.) T. ALFRED STIFF; Grantham, Victor Drive, Leigh-on-Sea.

XANTHORHOË GALIATA VAR. UNILOBATA IN DEVON.—On July 21st of this year I took a fine female *X. galiata* of the dark-banded



*unilobata* form in a lane near Tavistock. South ('Moths of the British Isles,' series ii. p. 195) mentions this form as "occurring in Yorkshire, Sussex, and probably elsewhere," so that a record of its occurrence in Devonshire may prove of interest.—(Rev.) ALFRED T. STIFF, M.A.

EARLY PUPATION OF *LASIOCAMPA QUERCUS*.—During late June of this year a very large female of *Lasiocampa quercus*, approaching var. *calluna*, was brought to me in a box. It was in a very ragged condition, and had deposited a large number of ova. Larvæ from these hatched in the usual time and commenced feeding on white-thorn. As they continued to feed beyond the hibernating stage, I kept up the supply of whitethorn leaves so long as these were available. I have since kept them going on bullace and blackthorn shoots (from the root suckers), also berries and twigs of the white-thorn. They are now all about full-grown, and several have pupated, the first one on November 13th. Although I have frequently reared these larvæ, and also those of *Gastropacha quercifolia*, I have not previously seen them feed right through before. Possibly the long spell of summer weather accounts for this. In this fen and marshy district all Lasiocampidæ are much finer than those I have taken in Kent.—HERBERT WM. BAKER; 73, Limetree Place, Stowmarket, Suffolk, November 22nd, 1914.

[Normally, larvæ of *L. quercus* and of *G. quercifolia* do not pupate until after hibernation. Sometimes in confinement, however, it happens that full growth is attained, and pupation effected in the year that the larvæ hatch from the egg.—ED.]

SPHINX CONVULVULI IN NORFOLK.—Not having seen any report of the capture of *Sphinx convolvuli* in your Journal this season, I thought it might interest some of your readers to know that I had a very fine freshly emerged specimen brought me during the first week in September. The person who found the insect was afraid of it, so put a large jar over it.—ROBT. S. SMITH, Junr.; The Laurels, Downham Market, Norfolk.

BUTTERFLIES IN DERBYSHIRE.—This season has been exceptional for butterflies in Derbyshire. *Vanessa io* was noted here on September 30th; rather a rare species here. *V. urtica*, which has been scarce of late years, was plentiful. *Pyrameis cardui*, usually very rare, was reasonably common. *P. atalanta*, usually common in September, was markedly so this year. They were also about late in October in consequence of the absence of frosts.—W. ST. A. ST. JOHN; Derwent House, Derby.

LATE APPEARANCES OF *ACIDALIA EMUTARIA* AND *TOXOCAMPA PASTINUM* IN LINCOLNSHIRE.—On a piece of marshy ground bordering the sandhills on the Lincolnshire coast, between Skegness and Sutton-on-Sea, I netted a specimen of *Acidalia emutaria* at dusk on September 4th, and another on September 5th. Both had recently emerged. On September 7th in a drier portion of the same ground where *Vicia cracca* was growing in some profusion, a specimen of

*Toxocampa pastinum* was caught flying. Both were presumably members of a partial second brood, and in the case of *T. pastinum* this is probably worth noting. It is perhaps also desirable that the locality should be put on record.—W. G. WHITTINGHAM; Knighton Vicarage, Leicester.

ARASCHNIA LEVANA REPORTED FROM HEREFORDSHIRE.—I beg to record the capture of two specimens of *A. levana* at Symond's Yat, near Ross, Herefordshire, between July 20th and 24th last. Another collector, whom I met in the district, informed me that he had taken nearly a dozen examples several miles away.—A. W. HUGHES; 33, Dacy Road, Everton, Liverpool, October 24th, 1914.

GRAPTA C-ALBUM AND ARASCHNIA LEVANA FROM FOREST OF DEAN.—Amongst a few *Grapta c-album* recently reared from a Forest of Dean female, I have bred two aberrations. Unfortunately one is dwarfed and crippled, but the other is a perfect male. The usual two spots in the outer area of the primaries are represented by a small dot, whilst the secondaries have the darker markings spread over almost the whole of the wing, obliterating the ground-colour and giving the wings a smeared appearance. This aberration is rather similar to one I captured in the same district in July, 1912, except that the wild specimen is of the *hutchinsoni* form, and the markings are of a deeper brown. *Araschnia levana* was about in the Forest during the latter half of July last. Eight specimens fell to my share, and I heard of five others being taken.—G. B. OLIVER; October 22nd, 1914.

CORDULEGASTER ANNULATUS IN THE NYMPH STAGE.—Following up a note in the 'Entomologist' of October last (p. 278), I may mention that on October 2nd I found the nymphs of *Cordulegaster annulatus* in some marshes at Augarrack, near Hayle, Cornwall, in various stages of growth. Some were small enough, I should say, to have been hatched this season; others were, so far as outward appearances go, full grown, and might have emerged this summer. These will not now come out until next June. They certainly cannot have been hatched later than in June or July, 1913, which would make their nymph stage two years in all. But they may have been hatched in 1912. It seems strange they should be full grown, externally, at any rate, nine or ten months before they emerge.—HAROLD HODGE; 9, Highbury Place, N., November 14th, 1914.

FORMALDEHYDE USEFUL IN SETTING INSECTS.—It is safe to say that, at some time or other during one's career as a collector, everybody has viewed with disgust the relaxing and consequent drooping of wings of one or more cherished imagines that have been placed in the cabinet or store-box. It struck me last spring that this might be overcome by the use of formaldehyde. I think that I may say my experiment has been crowned with complete success. My procedure briefly is this:—After the moths or butterflies have been on the setting board for a fortnight or three weeks—a fortnight is quite sufficient—place the board with imagines, as they are, in a box that

is fairly air-tight, containing also a piece of cotton-wool soaked with 40 per cent. of formaldehyde. (I use my travelling-case, and plug up the perforations at either end with the cotton-wool.) Leave the box closed for a week, and the imagines are ready to be transferred. Last year I had a lot of imagines that drooped, but this year, since using formaldehyde vapour, not one has played me false. To be quite certain, last week I took two imagines at haphazard, one a butterfly and the other a moth, and placed them in my corked zinc relaxing-box immediately after I had saturated the cork with boiling water, closed the box, and left it for five days. On examination both imagines were found to be soaked with moisture, but neither had budged in the slightest, and I am certain that I should not have been able to reset them in a new position. For those who like to change their setting with every new fashion this might prove a disadvantage, but for those who know their own minds it would not be a deterrent. A friend of mine suggested that the formaldehyde might alter the colours, but so far I have not found this to be the case; it is true that I have not had a chance to try the process on any of the "emeralds," but I might point out that formaldehyde is used largely in making pathological specimens for museums, where it is very important to preserve colours. I claim another advantage for my process. Inasmuch as formaldehyde is a powerful germicide, one can be sure that every insect that goes into the cabinet goes in sterilized. There is another point that I am watching with interest, namely, whether it will check "grease." This is, I believe, a post-mortem change akin to the formation of adipocere in the human subject, so that if the insect is thoroughly sterilized it is only reasonable to hope that the "grease" may be checked.—WINSTON ST. A. ST. JOHN, M.R.C.S., L.R.C.P.; Derwent House, Derby, November 11th, 1914.

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## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 22nd.—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—The evening was set apart for an exhibition and discussion of the genus *Anthrocera*, introduced by Mr. B. S. Curwen. Mr. Curwen exhibited a collection of Palæartic Anthroceridæ, consisting of some twenty-six species and forms.—Dr. E. A. Cockayne, the series of *A. hippocrepidis* from the late Mr. J. W. Tutt's collection, with various series of *A. filipendulæ*, *A. trifolii*, *A. palustris*, and *A. loniceræ*.—Mr. F. H. Stallman, early and late races of *A. trifolii*, *A. filipendulæ*, &c.—Mr. Buckstone, similar series with suggested hybrid series *trifolii* × *filipendulæ*.—Dr. Chapman, a drawer of European Anthroceridæ captured during the last few years, including *A. anthyllidis*, *A. contaminæi*, *A. sarpedon*, &c.—Mr. Hy. J. Turner, series from many localities, mainly of the five- and six-spotted species of the Transalpiniformes group.—Mr. L. W. Newman, series of bred Anthroceridæ species.—Papers and notes were read and communicated by Messrs. Curwen, Cockayne, P. A. Buxton, Turner,

R. Adkin, &c.—Mr. Newman exhibited long varied series of *Dianthæcia barrettii*, bred from Co. Cork and from S. Devon; bred series of *Boarmia repandata* from the Wye Valley and from N. Cornwall; and a series of the more hybrid *populi*  $\times$  *ocellatus*.—Mr. Longe, the same hybrid and a *Rumicia phleas* from Deal, with the red sub-marginal band on the hind wing quite wanting.—HY. J. TURNER, *Hon. Rep. Sec.*

LONDON NATURAL HISTORY SOCIETY.—April 21st, 1914.—Mr. Bernard Cooper, a fine asymmetrical specimen of *Numeria pulveraria*, bred in March, 1914, from New Forest ova, in which the band was obsolete on the right fore wing.

May 19th.—Mr. A. W. Mera, on behalf of Mr. B. S. Williams, a melanic specimen of *Lycia hirtaria*, bred at Finchley from wild pupæ.—Mr. A. J. Willsden, the reciprocal hybrids of *Lycia hirtaria* and *Nyssia zonaria*.

June 2nd.—Mr. J. Riches, *Colias edusa*, ab. *helice*, bred from Eastbourne ova.

September 1st.—Mr. H. B. Williams, a short series of *Euchloë cardamines*, bred in May, 1914, including a male with extra spot below the discoidal spot, under side. A long series of *Polyommatus icarus*, taken in June at Boxhill and Banstead Downs, showing strong tendency to obsolescence in the spotting of the under side. Also two gynandromorphous specimens of *Amorpha populi*, bred on August 2nd from June ova.—Mr. W. E. King, specimens of *Zizera minima*, and abs. *obsoleta* and *extrema*, from Horsley.—Mr. Williams read a short paper on the season's collecting.

October 6th.—Mr. G. H. Heath, a fine series of *Boarmia repandata* from Lynton, including ab. *conversaria*.—Mr. C. H. Williams, *Polyommatus icarus*, from Ireland, also an obsolete male and ab. *antico-striata*, Tutt.—Mr. W. E. King, a series of *P. icarus* taken at Horsley this year, including abs. *striata*, *obsoleta*, *antico-obsoleta*, *subobsoleta*, *postico-apicalis*, *costajuncta*, *melanotoxa*, &c.—Mr. L. W. Newman, a gynandromorphous *P. icarus*, having right fore wing female, remainder male, except one red female lunule on each hind wing, another chiefly female but having small male patches. Also a gynandromorphous *Agriades thetis*, chiefly female but with a splash of male colour along the costa of the right fore wing; *Agriades coridon* ab. *minutissimus*, and a series of *Gastropacha ilicifolia*, bred from a female taken at Cannock Chase in 1913 by Mr. G. B. Oliver.—Mr. H. B. Williams, a long series of *Agriades coridon* taken in August, 1914, in North Herts, including long series of abs. *semi-syngrapha*, Tutt, *inequalis*, Tutt, *parisiensis*, Gerh., and fine series of *obsoleta* and *striata* under sides, male and female, also a female of the colour of *C. pamphilus*, a female with bluish suffusion over the greater part of the under side of the right hind wing. Also a series of *P. icarus* from the same place, including fine blue females, and abs. *melanotoxa*, Marrott, *biarcuata*, Tutt, *basijuncta*, Tutt, *costajuncta*, Tutt, and forms combining *melanotoxa*, *costajuncta* and *basijuncta*; also ab. *antico-striata*, Tutt, four extreme ab. *subobsoleta*, Tutt, two



ab. *obsoleta*, Clark, and other interesting forms.—Mr. V. E. Shaw, living pupæ of *Cyaniris argiolus*.—Mr. A. J. Willsden, larvæ, pupæ and imagines of a species of Micro-lepidoptera found feeding in a cargo of peanuts captured from the Germans. The species has not been identified.—HAROLD B. WILLIAMS, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—November, 1914.—Meeting held at the Royal Institution, Colquitt Street, Liverpool; Mr. R. Wilding, President, in the chair.—This being the opening meeting of the Society it was, as usual, devoted to exhibits of the season's work.—Mr. F. N. Pierce showed *Carterocephalus paniscus* from Northants, and a large number of Micro-lepidoptera, including *Laspeyresia gemmiferana*, *Penthina gentiana*, and *Leioptilus microdactylus* from Devon, also *Dicrorampha saturnana*.—Mr. A. W. Hughes brought a long series of *Vanessa c-album*, including var. *hutchinsoni*, also *V. lavana* from Herefordshire; he reported that the latter insect seemed to be establishing itself there. By the same member, a long series of *Lycæna astrarche* and its var. *semi-allous* from Silverdale.—Mr. Buckley had a fine series of *Odontopera bidentata* var. *nigra* from Birmingham, also the local form of the same species from Urmston; varied series of *Agrotis ashworthii* and *Boarmia repandata* from North Wales, *Dianthæcia nana* from Anglesey, and *D. capsophila*, pale forms, from Eastbourne.—Mr. R. Tait, junr., brought three large cases containing the results of his holiday in South Devon; these included *Leucophasia sinapis*, *Syriethus malvæ* var. *taras*, *Cidaria russata*, and var. *centumnotata*, as well as varieties of *Lycæna icarus*. From Penmaenmawr, the following taken at heather bloom: *Agrotis ashworthii*, *A. lunigera*, *A. lucerneæ*, and *Mamestra furva*; he also found *Acidalia contiguaris*, and for the first time captured wild the local melanic form of *Boarmia repandata*. From Huddersfield a very fine lot of varieties of *Abraxa grossulariata*, which included a grand series of var. *nigrosparisata*, and one remarkable specimen having the left side wings black with a few marginal streaks on the hind wing, while the wings on the right side were typical.—Dr. J. Cotton brought a fine specimen of *Acherontia atropos*, captured at light at Knowsley early in October.—Mr. R. Wilding showed fine series of *Rhopalocera* from the New Forest, Silverdale, and Ireland; noteworthy among these was a fine row of Irish females of *Lycæna icarus*.—Mr. W. Mansbridge brought a long bred series of *Aplecta nebulosa*, the progeny of Delamere parents; these included the local type form, var. *robsoni* and a scarce leaden-grey variation; also a short series of *Abraxa grossulariata* from Huyton, of which a number were var. *lacticolor*; dark *Polia chi* from Hebden Bridge, and *Odontopera bidentata* var. *nigra* from wild larvæ beaten on Simonswood Moss, in which locality, although of rare occurrence, this form seems to be increasing.—WM. MANSBRIDGE, *Hon. Secretary*.

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INDEX.—As the Special Index is not complete for publication in this issue, the General Index will be published with it in January.

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VOLUME THE FORTY-EIGHTH.

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## CORRIGENDA ET ADDENDA.

- P. 17, l. 3 from bottom, for *flavilinata* read *flavilineata*.  
 P. 24, l. 2 from top, for *Aisne* read *Ain*.  
 P. 63, l. 14 from bottom, for *Coxhame* read *Coxhorne*.  
 P. 64, l. 8 from top, for *Freitschke* read *Treitschke*.  
 P. 64, l. 16 from bottom, for when and how read where and how.  
 P. 79, l. 32 from top, for *Cartier* read *Carlier*.  
 P. 120, l. 6 from bottom, for *Nander* read *Van der*.  
 P. 212, l. 22 from top, for *asterius* read *asterias*.  
 P. 224, l. 16 from bottom, for *duly* read *duty*.  
 P. 226, l. 35 *et seq.* from top, for *Euphocades* read *Euphœades*.  
 P. 226, l. 11 from bottom, for *ajax (turnus)* read *ajax*; *turnus*.  
 P. 228, l. 20 *et seq.*, from bottom for *Benzoni* read *Benzoin*.  
 P. 240, l. 3 from bottom, for ♂ read to.  
 P. 241, l. 2 from top, add a comma after *lighter*.  
 P. 241, l. 5 from top, after *lighter* add *than*.  
 P. 241, l. 6 from top, after *diminishing* add *much*.  
 P. 241, l. 18 from top, for *dark brown* read *light brown*.  
 P. 252, l. 20 from top, for *auronitens* read *aureonitens*, Seitz.  
 P. 267, l. 12 from top, *momento* read *memento*.

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## ON THE HYBRIDS OF THE GENUS *OPORABIA*, WITH SOME NOTES ON ITS MICROGENES.

BY J. W. H. HARRISON, B.Sc.

THE genus *Oporabia* is a very old group, and one which, in spite of the fewness of the species included therein, it is very difficult to understand. This difficulty arises from the fact that, being hide-bound so to speak by the Linnean conception of a species, students of the group are unable to decide upon what constitutes a species within it. Grant the validity of the Jordanian species, and the indecision vanishes. Jordan looked upon each Linnean species as "une espece collective," comprising within itself several "little species," or, as I call them, "microgenes." Each of these microgenes will stand the critical test of breeding true, and, in many cases, is differentiated structurally—very slightly, of course—from its neighbours. I have adopted the name "microgene" in preference to either "subspecies" or "local race," because the labours of Fruhstorfer and others have reduced the name "subspecies" to represent an entity of almost no value; on the other hand, these microgenes are not local races in any sense of the word. Well-known examples of genera, containing within their limits species with hosts of microgenes, are the plant genera *Hieracium*, *Rosa*, *Rubus* and *Mentha*; no one would dream either of calling *Rubus argentatus* a local race of *R. fruticosus*, or of recognising in *Rosa dumetorum* a local race of *R. canina*.

In my view the Linnean species *Oporabia autumnata* (Bkh.) comprises, in this district, four microgenes. These are *O. autumnata* (sens. strict.), *O. alticola*, *O. pinivoraria* and *O. filigrammaria*. Similarly, locally, we find *Oporabia dilutata* (Bkh.) containing three forms of the same value, viz. *O. dilutata* (sens. strict.), *O. fraxinaria* and *O. christyi*. The importance to be attached to these forms has been hopelessly obscured in the past, not only in this genus but also in other Lepidopterous



genera, by the energies of various "name-mills"—energies that have led to a large amount of cross classification, for we have included within the same aberration parallel forms of several microgenes. Details regarding the various forms are in tabular form at the end of the paper.

Let me return, for the sake of illustration, to the plant genera enumerated above, the microgenes of their several species having been so systematically worked out by Babington, Baker, Jordan, Sudre, Dumortier, and other equally well-known botanists. Possibly not one half of the named forms described in these genera have the slightest claim to be regarded as "species," but are hybrids between the various microgenes, as has been experimentally proved in certain cases. These hybrids, naturally, are in many instances intermediate to two well-defined microgenes, and transition forms crop up and provide the causes of so much apparent variation within the limits of the Linnean species. Such spurious transition forms give then, in the absence of Mendelian dominancy, what appear to be cases of continuous variation; when viewed correctly they prove the opposite.

In spite of this continual hybridising with allied forms the microgenes are not swamped, and continue true to type, proving that they are, at least, of greater value than the hosts of named "aberrations." The form which, for the sake of convenience, I have labelled *O. pinivoraria* surrounds here a colony of *O. autumnata vera* (or, to use the trinominal nomenclature now so popular, *O. autumnata autumnata*), and is overlapped by *O. filigrammaria*. Nevertheless, the three forms, year after year, remain quite distinct; so too do *O. alticolaria* and *O. filigrammaria*, which also overlap.

Turning now to the Linnean species, it becomes necessary to give my definition of what is included in the term. In my own mind I define a Linnean species as a form which, hybridised with a form of equal value, yields progeny which, when paired *inter se* or crossed with either parent, is more or less sterile; in some cases the first cross is sterile. In addition, in the Insecta, I attach great importance to the genitalia.

That *Oporabia autumnata* and *O. dilutata* are Linnean species my experiments confirm, but the proofs obtained from other considerations have been ably worked out by Prout (Ent. March, 1900; Trans. City of London Ent. and Nat. Hist. Soc. 1899). It is not necessary, therefore, to repeat what he says here. The phylogeny of the two species is very clear, and may be readily worked out in several ways. *O. autumnata*\* is Holarctic, whilst *O. dilutata*\* is practically confined to the Palearctic

\* In this paragraph it will be understood that the names "*dilutata*" and "*autumnata*" are used in the Linnean (collective) sense, and also at other points where no confusion is likely to arise.

region. From this fact alone it is easy to see that, in all probability, *O. autumnata* is the older form, a statement that is confirmed by the fact that both ova and larvæ of *O. dilutata* are more specialised, and its genitalia slightly more complex, the valves possessing a strong spine.

Owing to the attraction which difficult species possess for those of an enquiring nature, attempts to hybridise these two forms by other observers were made several years ago, but proved unsuccessful. Becoming interested in these unsuccessful attempts, and having gained experience in my very successful experiments with the *Bistonina*, I determined to repeat the trials. For that purpose I reared a large number of imagines from local ova of *autumnata*, but my first attempt proved futile, for the microgene *pinivoraria* was chosen, and this emerges in mid-September and is quite over by the end of the month; *dilutata vera* does not emerge until mid-October. The experiments had to be postponed until the following year, when use was made of imagines of the form *alticolaria*, which emerge over a period extending from late September to late October. Retarding or forcing has little or no effect in this genus, and one must use microgenes emerging at the same time. These preparations were not in vain, as, when the first *dilutata* emerged in October, 1912, I had both sexes of *alticolaria* already in the cages. The *dilutata* males, as they emerged, were placed with *alticolaria* females, and *vice versa*. Successful pairings were secured at once; these differed, in the case of *dilutata* ♂ × *autumnata* ♀ crossing, from normal pairings of the two parent species, inasmuch as, instead of separating after a few minutes, the pairs remained *in cop.* for twenty-four hours. Eggs, however, were freely laid as a result of both cross-pairings during the second night, and very soon displayed their fertility by turning salmon-pink in the case of ova laid by *autumnata*, and dull ruby red in the reverse case. These ova remained unhatched until the following April, when practically every egg yielded a larva.

The larvæ were offered hawthorn, and this food they adopted. In habit the larva resembled, in both cases, those of *autumnata*, for they ate ravenously and stuck close to their food, displaying none of the tendency of *dilutata* larvæ to wander. Description of the larvæ is quite unnecessary, because they bore every character of *dilutata vera* larva superimposed on those of *alticolaria*. In none of my numerous experiments have I had such a perfect combination.

Pupation took place in early June, and I naturally expected the pupæ to æstivate for four months like those of their parents, but such was not to be the case with all; sixteen days after pupation a female imago emerged in the *dilutata* ♂ × *autumnata* ♀ pot. This was quickly followed by a number of others, all

females. Six weeks elapsed, and, as no other moths emerged, I dug up the remainder of the pupæ in this pot and also all of those in the other; practically every pupa was sound and healthy. They were, therefore, laid aside, packed in moss as usual, and a strict eye kept on them, but no further emergences occurred until October, *i.e.* the normal time for the parents, when the remainder of the *dilutata* ♂ × *autumnata* ♀ cross came out and proved to be all males. The imagines of the reciprocal cross emerged almost at the same time, and yielded the sexes in equal proportions. In the case of the *dilutata* ♂ × *autumnata* ♀ the sex proportions were 7 to 1 in favour of the females.

The imagines were curious-looking objects, which it is impossible in many instances to describe or figure. I shall confine myself, therefore, to the consideration of the points usually relied upon, when present, to separate the two species.

I.—*OPORABIA HYBRID ROBSONI* = *O. DILUTATA* ♂ × *AUTUMNATA* ♀.

The *dilutata* males used to produce this cross were of the melanic form, and the result has been that, in the case of the females, the melanism has almost obscured the markings; on the contrary the males, although possessing a rather brownish grey ground, are rather strongly and clearly marked. These facts are of some significance, for it seems as if some cross inheritance has occurred, for in the present forms, no matter how melanic the specimens, the females are generally clearly marked, whilst the males often bear confused markings.

It is absolutely certain that if the hybrid males were taken wild and no preparations made of the genitalia, they would be set down as a form of *autumnata* very little removed from the ordinary; just as certainly, except for the white V, derived from *autumnata*, at the junction of vein two with the cell, the females would be regarded as *dilutata*, although this *dilutata* appearance may be the result of the melanism present. I shall now proceed to point out the distinctive characters of hybrid *robsoni* :—

- (1) *The male antennæ.* The male antennæ are distinctly intermediate between the fine antennæ of *autumnata* and the more coarsely jointed ones of *dilutata*.
- (2) *Line bounding basal area.*
  - (a) Male. Distinct, and forms a right angle as in *autumnata*.
  - (b) Female. More rounded and nearer *dilutata*.
- (3) *Band between basal line and that bounding central area.*
  - (a) Male. Practically obsolete or forming a suffusion as in *autumnata*.
  - (b) Female. More band-like, as in *dilutata*.



(4) *Elbowed line.*

(a) Male. Almost as direct, and forming as perfect a right as in *autumnata*.

(b) Female. More or less waved, and, as it bends, almost curving to the discal spot, as in *dilutata*.

(5) *Subterminal band.*

Male. Too confused to describe, but characters intermediate.

Female. Almost a solid block; inwardly rounded, as in *dilutata*.

(6) *Discal point.*

Male. Sharp and clear; not touched elbowed line; almost as in *autumnata*.

Female. Confused; generally united to elbowed line.

(7) *Terminal band of hind wings.*

Male. A solid smoky block.

Female. Somewhat similar, but scallops of *dilutata* quite visible.

## (8) Both sexes have the white V at the junction of vein two with cell well-developed. This stands out very clearly in the darker suffused female.

(9) *Genitalia.*

Male. Spine on valve developed, but small; head of labides intermediate. Cristæ on juxta eleven as in *alticolaria* (*autumnata vera* has nineteen). Shape of valve irregular. Costal ridge doubled.

Female. Upper signum\* of bursa copulatrix knobbed and intermediate. Lower peg-shaped, as in *dilutata*.

(10) In other characters where the species differ, i.e. shape, size, &c., the male is slightly nearer *autumnata*, and the female more or less intermediate.

## II.—OPORABIA HYBRID RUNGEI = O. AUTUMNATA ♂ × O. DILUTATA ♀.

In the case of this cross, moths of the same parentage as those used for the reciprocal cross were employed. The product, however, is totally different. Except that the white V so prominent in *robsoni* is absent, the two sexes would pass for suffused *autumnata* with more or less confused markings, this suffusion being somewhat weak, and the result of the melanism inherited from the female parent. In both sexes there is a general out-of-focus effect, giving the impression that we have here a blurring due to a failure in securing the exact superimposition of two images, such as one often sees in colour printing.

The genitalia in both sexes show the same tendencies as in *robsoni*, but the divergence from *autumnata* is not so great.

\* Pierce ('Genitalia of the Geom.,' p. 41) is wrong in saying that the signa are discoid. In both *dilutata* and *autumnata* the upper one is knobbed, scobinate; in *autumnata* the lower is discoid, and in *dilutata* peg-shaped.



## CONCLUDING REMARKS.

The outstanding features of these experiments are as follows:—

(1) The acceleration in development of the females in the *dilutata* ♂ × *autumnata* ♀ cross.

(2) Only these females showed melanism in this cross.

(3) Apparently *autumnata* is more potent in affecting the products. That the hybrid origin of a form has the effect of hastening its development in the pupal stage, in some cases in one sex only, in others in both, has been known for a long time. One of the first points to which the earlier experimenters with *Smerinthus hybridus* drew attention was this very fact, and the same observation was made by Standfuss in the case of his *Drepana* and *Clostera* hybrids, and by myself with the *Biston*—*Ithysia* crosses.

No satisfactory suggestions as to the cause of this displacement have ever been made. That we have to look to the disorganisation of metabolism due to hybrid origin is perfectly clear, but how this is brought about is certainly not obvious.

Cytological observations have shown that, in the case of hybrids between species in which the number of homologous chromosomes is small, gametogenesis occurs without reduction division, so that in the gametes of the hybrid insects we have nearly the somatic number of chromosomes present. This mode of formation of gametes may be accomplished at a much greater speed than in the case of a pure species, a feature that may be accompanied by a correspondingly earlier somatic development; hence an earlier emergence of the insect than is usually the case may be expected.

A point, too, that possibly has some bearing on the case is that, when some species are rapidly forced, a rapid appearance of the imago is accompanied by immaturity of the sexual products.\* Possibly, then, the degenerate nature of the germ cells, especially visible in some hybrid females, may react on the somatoplasm and induce a precocious development of the soma. The ova of the accelerated females of *robsoni* are defective, as dissection and subsequent microscopic examination prove.

(To be concluded.)

SOME NEW MELANIC *EUPITHECIA* ABERRATIONS.

BY LOUIS B. PROUT, F.E.S.

MR. G. B. OLIVER, of Wolverhampton, has sent for my inspection some very interesting melanic *Eupithecia*, representing in part species in which—so far as my knowledge goes—extreme

\* As in the case of *Deilephila elpenor* in my own experiments.

melanism has never yet been described, although there are one or two general remarks in our literature to the effect that the phenomenon seems widely spread in the genus, and one or another of the forms described below may be already known to individual entomologists.

*Eupithecia nanata* ab. *oliveri*, n. ab.

Fore wing black with a tinge of brown, especially in the areas which in pale *nanata* usually show brownish clouding, namely, near the apex, and more particularly between the third radial and second median veins; cell-mark deeper black; a few whitish scales, indicating the position of the pale postmedian band; an extremely slender, inconspicuous, interrupted, subterminal whitish line, ending in a very slender V-shaped mark near the tornus. Hind wing equally black at inner margin, slightly less so anteriorly; whitish subterminal line weakly indicated. Under surface nearly uniform smoky-blackish, glossy. Thorax and abdomen black. Warwickshire—the type (♀) bred from larva, June 27th, 1914, by Mr. Oliver, who tells me he believes Mr. L. W. Newman also bred one two years ago from pupæ with which he supplied him.

*Eupithecia lariciata* ab. *nigra*, n. ab.

Uniform sooty-black with deeper black cell-mark and veins, the hind wing not quite so deep in tone, the veins consequently showing up more sharply; basal dark markings of fore wing extremely faintly indicated. Under surface unicolorous dark grey, the veins scarcely differentiated. Thorax and abdomen black, without the characteristic white spot. Warwickshire—the type captured June 12th, 1914, by Mr. Oliver's son. A second example was met with last spring, but was too worn to set. Except for the slight differences of wing-shape, this form would be virtually indistinguishable from *E. tripunctaria* (ab. *albipunctata*) ab. *angelicata*, &c.

*Eupithecia innotata* ab. *unicolor*, n. ab.

A small second-brood form of an almost absolutely unicolorous dark grey, the fore wing with deep black discal mark, the costa of the fore wing and inner margin of hind wing with very faint indications of darker spotting; on the fore wing, in addition, the position of the angulated postmedian line is just discernible through a slight darkening of veins SC<sup>1</sup>, R<sup>1</sup>, and R<sup>2</sup>, just proximally to it, and an entire interruption of the darkening distally thereto (where the first outer pale line would cross the said veins), and there is a faint row of pale lunules indicating the subterminal. The type (♂), bred in August, 1914, from a Durham strain provided by Mr. J. W. H. Harrison. The second-brood specimens (known on the Continent as ab. *fraxinata*) are commonly darker and more weakly marked than the first brood, but this extreme development is new to me.

In addition, Mr. Oliver has obtained in his district *E. castigata* ab. *obscurissima*, Prout (Seitz, Macrolep. iv. p. 287), though not of quite such a deep black as my types, and a rather dark brownish form of *Gymnoscelis pumilata*.

## SOME INTERESTING RHYNCHOTA FROM BRITISH INDIA.

By W. L. DISTANT.

In the second volume of the 'Rhynchotal Fauna of British India' (p. 206) I described a new genus and species of Reduviidæ (*Eugubinus araneus*) found living in the nest of a spider (*Theridium* sp.) near Bombay. This was an immature form of the species, as might be gathered from the descriptive word "apterous." I have since received two other species from the Calcutta Museum, both of which are found in webs of spiders (*Cyrtophora cicatrosa*, Stoliczkza). These are new but closely allied species, as shown by the following comparative key:—

1. Anterior lobe of pronotum a little shorter than posterior lobe.
  - A. Anterior femora moderately slender, finely spinose.
    - B. Rostrum with the first and second joints strongly incrassated.
      - a. Apices of posterior femora black.
        - b. Head and pronotum fuscous with central pale longitudinal lines . . . . *E. reticolus*.
  2. Anterior lobe of pronotum about as long as posterior lobe.
    - AA. Anterior femora moderately robust, strongly spinose.
      - BB. Rostrum with the first and second joints moderately incrassated.
        - aa. Apices of the posterior femora greyish-white.
          - bb. Head and pronotum black . . . *E. intrudans*.

*Eugubinus reticolus*, sp. n.

Head and pronotum fuscous-brown, head in front of eyes blackish; a central pale greyish longitudinal line traversing post-ocular area of head and pronotum, the latter with its posterior lateral margins also greyish; antennæ black, annulated with greyish-white; hemelytra pale fuscous brown, the basal costal margin greyish; abdomen blackish, its apex and segmental spots pale ochraceous or greyish white; legs blackish, strongly annulated with greyish-white, apices of the posterior femora black; head with the anteocular area shorter than the postocular, head distinctly constricted at base, eyes greyish-white, large and prominent; rostrum reaching the anterior coxæ, first and second joints strongly incrassated and almost subequal in length; antennæ slender, first joint about as long as head and thorax together; pronotum with its anterior lobe a little shorter than posterior, broadest and truncate anteriorly, attenuated posteriorly; anterior coxæ scarcely more than half the length of anterior femora, which are armed beneath with short greyish spines; hemelytra not extending to abdominal apex. Long. 13 millim.

Hab. Calcutta; salt lakes below Chingrighatta.

From webs of *Cyrtophora cicatrosa*, Stoliczkza.

*Eugubinus intrudans*, sp. n.

Head and pronotum black; antennæ black, annulated with greyish-white; hemelytra piceous; abdomen black, its apex and

segmental spots greyish-white or pale ochraceous; legs blackish, strongly annulated with greyish-white, apices of the posterior femora greyish-white; head with the antecular area shorter than the postocular, and distinctly constricted at base; eyes dull greyish, large and prominent; rostrum reaching the anterior coxæ, first and second joints moderately incrassated; antennæ slender, first joint about as long as head and thorax together; pronotum with its anterior lobe about as long as posterior lobe, broadest and truncate anteriorly, gradually attenuated posteriorly; anterior coxæ distinctly more than half the length of anterior femora, which are more robust than in the preceding species (*E. reticolus*), and more strongly darkly spinose; hemelytra not extending to abdominal apex. Long. 13 millim.

Hab. S. India, Cochin State, Ermakulam.

From webs of *Cyrtophora cicatrosa*, Stolickzka, at dusk.

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## NOTES ON THE LARVAL AND PUPAL STAGES IN SOME OF THE SESIIDÆ.

BY COLONEL R. H. RATTRAY.

IN 'Entomologist,' vol. xlv., pages 94 and 95, appeared an article by Lieut.-Col. Nurse on "The Duration of the Larval Stage in some of the Sesiidæ," expressing a hope that some other naturalists would give the results of their experiences. During the early part of the present year I gave up my whole time to these most fascinating insects. I therefore give my notes for what they are worth.

*Sesia cynipiformis* and *culiciformis* are quite common, and *Trochilium crabroniformis*, *S. andrenæformis*, *tipuliformis*, and *myopiformis* fairly so, but owing to nature of food-plant difficult to obtain.

As regards *T. crabroniformis*, I am of opinion that the larval stage extends beyond one year, but not more than two years. I have seen a large number of larvæ both full-fed and half-grown, but never any quite small ones, such as there would be if the stage lasted three years. Numerous woods were cleared during the winter of 1913-14. I searched them carefully, and interested the woodmen in the matter, with the result that I obtained some fifty larvæ. I found that all full-fed larvæ had cut exit holes and spun up ready to pupate before December. I kept all larvæ found in their original sections of saw in moist sand. All that had spun up turned to pupæ, with two exceptions, about the end of May, and all but five emerged safely during the last ten days of June. Two died without turning to pupæ, and five failed to emerge. All larvæ—many appeared quite as large as those that had spun up—that were feeding continued to feed, but owing to wood drying eventually died.



None of the larvæ that died were small when found, and were very active, moving freely up and down their burrows. Of the seventeen that had already spun up not one showed any inclination to move about, but in one or two instances, when the lower portion of cocoon was damaged, the damage was at once repaired. It therefore seems that *T. crabroniformis*, here at any rate, spins up ready to pupate either in autumn or beginning of winter, and not in spring as stated by other writers. It seems, therefore, that those larvæ that do not spin up before December of one year continue to feed during the following summer, and have a two-year cycle at least from egg to perfect insect.

*S. cynipiformis* is the commonest of the Sesiidæ in this area of Kent. Numerous woods were cut down during the winter 1912-13, leaving stumps of old oak trees in the ground. These trees were all sawn off close to the ground, leaving some six to nine inches exposed and covered with bark. I inspected a large number of these stumps during March and April of this year, and again during June and late July. During March and April I took out some 120 larvæ of all stages, some quite small—less than a quarter of an inch—others apparently full-fed. All, large and small, had spun themselves into a cocoon at the end of burrow with frass round it. I put them into a zinc box with holes in it for drainage; filled box with some oak sawdust and large pieces of bark. This box I put into a tin, covering with a bell-glass. I put the whole on the hot-water tank of the house and left them there, constantly moistening the sawdust. I looked at them daily and found they had all tunnelled into the oak bark, and continued to feed, eventually pupated and emerged. I bred out on an average seventy-five per cent. of larvæ, large and small. At the end of April all larvæ in stumps had grown considerably. I repeated the operation with similar results, but with a larger percentage of moths successfully reared. During June I only found full-fed larvæ and pupæ. Towards end of July I only found empty pupa cases—not a single full one and no larvæ. From this we can be sure that Col. Nurse's deductions are correct—that the larval stage does not last over one year.

*S. culiciformis* is almost as common here in larval stage as the last. I overlooked numerous woods where birch trees had been cut down during the winter 1912-13, through the spring of 1914. From the beginning of February to the end of March I went out, stripped the bark of the stumps about once a week, and obtained over one hundred larvæ. All had spun up and were resting through the winter in their cocoons. I forced these in the same manner as I did larvæ of other Sesiids, and about seventy per cent. emerged within a month. When I searched for them during third week in April I found they were turning to pupæ, about fifty per cent. having already changed. I again

searched birch stumps during last two weeks of July, and failed to find a single larva or pupa. I also stripped numerous birch stumps during March that had been cut during the winter of 1911-12. I saw plenty of old burrows, but failed to find a single larva or pupa in them. From this I conclude *S. culiciformis*, like *S. cynipiformis*, has only a one-year cycle from egg to insect.

*S. myopiformis*, though not rare, is more difficult to obtain. I searched old apple trees and found ten larvæ that looked like being full-fed. This was in April. These I also forced, putting them in apple sawdust and bark; they pupated at once, and in due course emerged, eight nice specimens. At the same time I found on other apple trees some seven or eight smaller larvæ, obviously not full-fed. I endeavoured to rear these, but all died. Of these seven or eight larvæ some were about a quarter of an inch long when found, others up to half an inch, but I never found small, and what I considered to be full-fed, larvæ on the same branch or on the same tree. I again searched the trees on which I had found full-fed larvæ during the last week in June, but only found empty pupa cases. From this I conclude that the larval stage of *S. myopiformis* lasts longer than one year, and probably two years in all.

Not far from here I obtained thirty-five larvæ of *S. andrenæformis* during April, 1914. I split open about half the sticks to examine the larvæ, closing them up again carefully. I kept the sticks in moist sand, and in due course bred out twenty-one imagines and three ichneumon. The remaining eleven larvæ fed for some time, but when the wood dried they came out of their burrows and crawled about cage till they died. These were almost as large as those that were full-fed. I also, in other sticks that I split without cutting from bush, saw some quite small larvæ less than a quarter of an inch long. I tied up twigs and left them. When first found the full-fed larvæ were fat, dead-white in colour, and resting head towards exit hole, but with no signs of cocoon. I did not see when they spun up, but one or two I looked at shortly before they emerged were in pupal stage. From the fact of finding larvæ in three stages, full-fed, large, and small, I think we may safely assume that the larval stage lasts at least two, and probably three, years.

Owing to feeding in stems of currant bushes, *S. tipuliformis*, though common, is hard to obtain. In the small extent of currant bushes to which I have access I found ten larvæ in April. Four died in larval or pupal stage and six emerged. All were found in bushes that had been heavily pruned the previous year, so the eggs could not have been laid or larvæ present earlier than 1913. No small larvæ were found anywhere in the garden; all were apparently same age. I do not think there can be any doubt that the life-cycle does not extend beyond one year.

During June I was searching some aspen trees for other larvæ. I noticed some lumps, or knobs, near end of twigs with suspicious holes and frass at exit. I opened two and found undoubted Sesiid larvæ between quarter and half an inch long. They were not larvæ of any Sesiid that I am acquainted with. Could they have been *S. tabaniformis*? They both died. I left other swellings, and if I am able to do so will again search next May or June. The twigs were not thicker above and below the swellings than an ordinary lead pencil; it is therefore unlikely to have been young *T. apiformis*, nor is *T. apiformis*, to my knowledge, found here.

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## NEW SPECIES OF HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### NOCTUIDÆ.

#### *Nyctipao albicincta obscura*, ab. nov.

♂. Differs from the typical form in having dark brown fringes to all wings on both surfaces; the transverse lines on upper side are suffused with dark brown, especially those of fore wings.

Expanse, 116 millim.

Collection number, 1828.

A male specimen from Horisha, May, 1908.

Except in the characters referred to this specimen does not differ from *Nyctipao albicincta*, Kollar (Hügel's Kaschmir, iv., p. 474, pl. 22).

#### *Bleptina bisectalis*, sp. n.

♂. Head brown; thorax blackish, mixed with grey, front brown; abdomen brownish grey, blackish tinged on posterior edge of each segment. Fore wings blackish, streaked and powdered with brown on costal area up to postmedial line; median nervure, and branches up to postmedial line, white; antemedial and postmedial lines white, inwardly oblique, the postmedial slightly indented before the dorsum; discoidal lunule white; subterminal line pale, wavy; fringes blackish, marked with white, preceded by black triangular marks between the veins. Hind wings dark grey, paler on costal area; two pale slightly curved lines beyond the middle, the outer one serrate; black triangular marks on termen; fringes dark grey. Under side of fore wings whitish strongly suffused with fuscous, costal area tinged with ochreous brown; discoidal mark and serrate postmedial line blackish, subterminal line pale ochreous but only distinct towards costa: hind wings whitish speckled and clouded with brown, discoidal lunule black preceded by a black spot in the cell; two blackish serrate lines beyond the middle, each line outwardly edged with whitish.

Expanse, 40 millim.

Collection number, 1497.

A male specimen from Arizan (7300 ft.), August 15th, 1905. There is a male, also from Arizan (Wileman), in the British Museum.

Allied to *B. ambigua*, Leech.

*Bleptina centralis*, sp. n.

♂. Head and thorax brown, grey mixed; abdomen whitish brown, darker on the posterior edges of segments. Fore wings brown with faint purplish tinge on the basal and terminal areas, medial area whitish sprinkled and clouded with brown; antemedial line black, slender, inwardly edged with white, almost straight; postmedial line black, outwardly edged with white, bluntly angled opposite the black discoidal lunule; subterminal line paler, wavy; terminal lunules black, fringes whitish brown marked with darker. Hind wings pale fuscous with traces of whitish transverse bands on the dorsal area. Under side whitish: fore wings suffused with fuscous brown; postmedial line black, excurved beyond the cell; discoidal dot black; subterminal line pale ochreous, only distinct on the costa where it is inwardly clouded with blackish: hind wings sprinkled with brown, chiefly on the costal area; discoidal lunule black, preceded by a black dot in the cell; postmedial line blackish, wavy, followed by a blackish interrupted band.

Expanse, 30 millim.

Collection number, 527.

One male specimen from Kaushirei, April 15th, 1908.

Near *B. descripta* Leech.

*Bleptina persimilis*, sp. n.

♂. Head and thorax brown, abdomen grey brown; antennæ fasciculate. Fore wings ochreous brown, basal area purplish brown; antemedial line purplish brown, nearly straight; medial line purplish brown, sinuous, outwardly shaded with brown; postmedial line (double) and subterminal line purplish brown, sinuous, the area between these lines shaded with brown; costal area between apex and subterminal line purplish brown; a black dot in the cell, two black dots at end of the cell with a third just beyond the lower, and a black spot in the first sinus of the postmedial line; terminal dots black. Hind wings pale fuscous brown, suffused with darker, a dusky discoidal mark and transverse line beyond; subterminal line whitish, broad and well-defined towards dorsum, faint towards costa. Fringes of all wings pale brown, marked with darker. Under side of fore wings pale brown suffused with darker; discoidal dot and line beyond darker: of hind wings pale brown sprinkled with darker; discoidal spot and curved line beyond blackish; subterminal line pale bordered with dusky.

Expanse, 34 millim.

Collection number, 1745.

Allied to *B. mimica*, Hampson.

A male specimen from Rantaizan, May 8th, 1909.



There is an example of each sex from Formosa (Wileman) in the British Museum.

*Bleptina incisa*, sp. n.

♂. Head and thorax grey mixed with brown, abdomen pale brown inclining to whitish. Fore wings creamy white, clouded with brown on middle of discal area; basal and terminal area black, the terminal deeply invaded by the ground colour about middle; discoidal mark black, lunular, some brown scales around it; terminal dots black, fringes pale grey darker towards apex of the wing. Hind wings fuscous grey with two paler bands. Under side whitish flecked with brown; fore wing with darker terminal area and black discoidal mark; hind wing with black discoidal lunule and black dot in the cell, tornal area barred with black.

♀. Similar but costal portion of black terminal area of the fore wings broader.

Expanse, 36 millim. ♂ ; 38 millim. ♀ .

Collection number, 1466.

One example of each sex from Arizan (7300 ft.), August, 1908. Near *B. figurata*, Hampson.

*Bleptina contigua*, sp. n.

♀. Head and thorax white, brown tinged; abdomen whitish brown. Fore wings white, faintly striated with brown, basal fourth freckled with brown except on dorsum; postmedial line dark brown, subterminal line whitish, space between these lines densely, and beyond the subterminal sparsely, powdered with brown; black marks on termen, fringes grey marked with darker. Hind wings white, dusky on basal half; postmedial band dusky, terminal line black, fringes grey. Under side of fore wings fuscous brown, mottled with darker; hind wings whitish sprinkled with brown chiefly on costal area, a black discoidal dot and two dusky transverse lines beyond.

Expanse, 28 millim.

Collection number, 1466 A.

A female specimen from Rantaizan, May 4th, 1909.

Allied to *B. propugnata*, Leech.

*Bleptina bidentata*, sp. n.

♂. Antennæ ciliate with paired bristles at each joint. Fore wings blackish on basal and terminal areas, whitish clouded with black-brown on medial area; antemedial line black, interrupted, outwardly edged with whitish, turned inwards towards dorsum; postmedial line black, wavy, bidentate about middle, incurved below middle, inwardly edged with white; discoidal lunule black; subterminal line pale, sinuous; terminal dots black, fringes whitish marked with blackish. Hind wings light fuscous; discoidal spot blackish, two dark transverse bands beyond, both outwardly edged with whitish. Under side of fore wings dark fuscous, a quadrate pale patch at apex: of hind wings whitish flecked with fuscous;

antemedial and postmedial lines blackish, wavy, a blackish band beyond the postmedial line; discoidal spot black, set on the antemedial line, a black dot in the cell.

Expanse, 34 millim.

Collection number, 527 A.

One example of each sex from Arizan (7300 ft.) August, 1908.  
Near *B. propugnata*, Leech.

*Bleptina terminalis*, sp. n.

♀. Fore wings dull purplish brown at the base and area beyond the postmedial line; medial area pale ochreous brown, traversed by a dark brown shade; antemedial line brown inwardly edged with whitish, oblique, limiting the basal area; postmedial line whitish edged with dark brown, turned inwards below the cell to vein 2, thence oblique to dorsum; subterminal line dark brown, sinuous, marked with white on the costa; space between the postmedial and subterminal lines dull purplish brown, and beyond the subterminal lines rather paler brown; discoidal lunule black, the extremities only distinct. Hind wings fuscous brown, medial and postmedial lines dusky, whitish edged. Under side fuscous brown, paler on hind wings, in the cell and at apex of fore wings; the hind wings have a black discoidal mark, and blackish medial and postmedial lines, the postmedial is outwardly edged with whitish towards dorsum.

Expanse, 34 millim.

Collection number, 1008.

A female specimen from Arizan (7500 ft.), September, 1906.  
Allied to *B. curvilinea*, Leech.

*Bleptina quadripuncta*, sp. n.

Head, thorax and abdomen brown-grey, dappled with darker brown. Fore wings greyish, sprinkled and clouded with brown; antemedial line whitish, straight, outwardly bordered with dark brown; postmedial line whitish narrowly edged with dark brown, almost parallel with the antemedial; a black spot divided by a whitish X-like mark; the basal portion of the costa suffused with dark brown, two dark brown clouds on terminal area, dots on termen black. Hind wings pale fuscous, postmedial line whitish, terminal dots black. Under side pale brown sprinkled with darker, all wings have a black discoidal spot and a pale postmedial line, area beyond the postmedial darker except on the termen.

Expanse, 38 millim.

Collection number, 1484.

One example of each sex from Kanshirei, June 4th, 1908.  
Near *B. parallela*, Leech.

LASIOCAMPIDÆ.

*Metanastria brunnea*, sp. n.

♂. Head brown with greyish hairs; palpi dark brown, antennæ paler brown; thorax dark brown, collar darker; abdomen brown,

tail blackish. Fore wings brown, inclining to reddish, brown hair on the basal half; postmedial line double, blackish, wavy; subterminal line composed of eight greyish white spots, the 5th and 8th set further in than others of the series, all edged with dark grey, the 7th and 8th centred with dark grey. Hind wings paler brown faintly tinged with reddish on basal area; traces of a blackish medial band. Under side pale brown clouded and suffused with darker; all the wings traversed by a dusky band.

Expanse, 68 millim.

Collection number, 1829.

A male specimen from Rantaizan (7500 ft.), February 20th, 1909.

Allied to *M. purpurascens*, Moore.

*Gastropacha taiwana*, sp. n.

♂. Head, thorax and abdomen brown. Fore wings brown with a faint greyish tinge, darker on basal area; discoidal spot black, and traces of a diffuse dusky subterminal line. Hind wings dark brown, paler on dorsal area; fringes brown, tips whitish between veins. Under side of fore wings reddish brown, paler towards termen: of hind wings brown, clothed with whitish hairs thickly covering the dorsal area.

Expanse, 56 millim.

Allied to *G. khasiana*, Swinhoe.

The type, a male specimen from Rantaizan (Wileman), is in the British Museum.

GEOMETRIDÆ.

*Pseudomiza aurata*, sp. n.

♂. Head, thorax and abdomen yellow. Fore wings yellow, freckled with brownish; antemedial line brownish, curved and indented; costa from base to antemedial line orange, suffused with brownish; postmedial line blackish, oblique from apex to dorsum just before middle, shaded with purplish brown; apical area purplish brown with greyish suffusion, enclosing four subhyaline spots, the third spot small and the fourth large; discoidal spot blackish. Hind wings yellow freckled with brownish; medial band brownish, not extending to costa. Under side as above, but the costa of forewings without orange colour towards base.

Expanse, 50 millim.

Collection number, 1823.

One male specimen from Rantaizan, May, 1909.

Allied to *P. flavescens*, Swinhoe.

*Pseudomiza aurata limbata*, ab. nov.

♂. Head and thorax yellow, orange mixed, abdomen yellow. Fore wings yellow, slightly freckled with brownish; basal and terminal areas orange freckled and clouded with brownish, the outer limit of the basal area irregular and edged with brown at costa, the inner

limit of terminal area oblique to apex where are four subhyaline spots set on the outer edge of a grey suffused purplish brown patch; discoidal dot blackish. Hind wings yellow freckled with brownish; medial band brownish outwardly edged with orange, not extending to costa. Under side yellow with traces of the brownish markings of upper side, the subhyaline marks of fore wings rather larger.

Expanse 50 millim.

Collection number, 1823A.

One male specimen from Arizan, May, 1908.

*Loxotephria taiwana*, sp. n.

♀. Head and thorax brown, the latter yellowish mixed; abdomen brown, darker at base, paler below. Fore wings yellowish, finely dusted with purplish brown; antemedial and postmedial lines purplish brown, inwardly oblique, both apparently angled below costa, but costal extremity of the antemedial not distinct; angle of postmedial brown shaded; subterminal line pale, angled below costa, outwardly shaded with brown; terminal line and fringes purplish brown, the latter paler at base. Hind wings yellowish, dusted with purplish brown; two purplish brown lines, the outer expanding on the costa; terminal line and fringes as on the fore wings. Under side yellowish, slightly freckled with purplish brown; on the fore wings the dorsum is whitish and the terminal area purplish brown except at apex; tranverse lines of upper side indicated on all wings.

Expanse 30 millim.

Collection number, 1255.

A female specimen from Kanshirei, May 2nd, 1908.

Allied to *L. padanga*, Swinhoe.

*Leucoctenorrhoe undulata*, sp. n.

♂. Fore wings white, costal and basal areas clouded with ochreous brown; subbasal line indicated by black marks on the veins; discoidal spot black; postmedial line black, slightly wavy, bent outwards below costa and inwards below vein 5, followed by ochreous brown and greyish clouds towards costa and by a black mark about middle; terminal dots black. Hind wings white; antemedial and postmedial lines dusky, only distinct on the dorsal area; subterminal line dusky, double; three black dots on termen. Under side white; postmedial line black, thicker than on the upper side, costal area beyond clouded with ochreous brown and streaked with blackish.

Expanse, 26 millim.

The type, which is in the British Museum, from Kanshirei, April 16th, 1908 (A. E. Wileman).

*Docirava flavilinata*, sp. n.

♂. Head and thorax grey; abdomen whity brown, pinkish below. Fore wings pale grey slightly tinged with pink, powdered with



darker grey, costa edged with pink; antemedial line ochreous outwardly edged with purplish brown, not reaching the costa; post-medial line ochreous, inwardly edged with purplish brown, incurved towards dorsum; discoidal dot purplish brown, faintly yellow margined; fringes pinkish, especially towards tips. Hind wings whitish brown, basal half fuscous tinged. Under side grey, suffused with pink on hind wings and on the apical area and the costa of fore wings.

Expanse, 32 millim.

Collection number, 937.

One male specimen from Tozan (8500 ft.), September 14th, 1906.

Allied to *D. æquilineata*, Walk.

#### ARBELIDÆ.

##### *Arbela discipuncta*, sp. n.

♂. Head and thorax pale brown mixed with darker; abdomen brownish grey, large tuft dark brown. Fore wings whitish, slightly tinged with brownish on basal area; a blackish mark below median nervure towards base and a smaller black mark above; a brownish grey spot at outer end of the cell; dorsum marked with brownish grey, as also is the terminal area except on costa; subterminal line whitish, irregular; fringes of the ground-colour marked with brown. Hind wings fuscous, brown tinged towards the base; fringes whitish marked with brown. Under side somewhat as above.

Expanse, 37 millim.

Collection number, 1246.

One rather worn male specimen from Kanshirei, April 27th, 1908.

Comes near *A. phaga*, Swinhoe.

#### LIMACODIDÆ.

##### *Narosa obscura*, sp. n.

♀. Head and thorax brown mixed with grey, abdomen rather paler. Fore wings pale brown, densely powdered with dark brown; two blackish marks on the disc, one in the cell and one below the cell, the latter oblique; fringes dark brown. Hind wings and under side whitish brown, fuscous tinged.

Expanse, 22 millim.

Collection numbers, 1353 and 1272.

Two female specimens from Kanshirei; the one described taken on April 30th, 1908; the other on September 8th, 1907.

Fore wings of the September example are paler than those of the type described. It appears to be somewhat worn, probably due to the absence of dark brown powdering.

Allied to *N. holoxanthia*, Hampson.

*Altha subrosea*, sp. n.

♀. Head, thorax, and abdomen yellowish buff, transversely marked with reddish. Fore wings yellowish buff, costa suffused with white especially towards apex; two double whitish lines on the dorsal area, not continued across the wing; three pale edged reddish brown spots at base of the wings, one at outer end of the cell, and an oblique series of five beyond the cell; fringes of the ground-colour, preceded by pale edged reddish brown lunules. Hind wings red, costa yellowish. Under side yellowish buff, all wings suffused with red on the disc.

Expanse, 28 millim.

Collection number, 1261.

Two female specimens from Kanshirei, June 5th, 1907, and July 10th, 1908.

*Thosea rufa*, sp. n.

♂. Head, thorax, and abdomen reddish brown. Fore wings reddish brown; postmedial line oblique, whitish, inwardly edged with dark purplish brown, slightly broadened on dorsum; subterminal line dusky, outwardly oblique from costal end of postmedial line to the termen just above the tornus; apical part of terminal area, limited by the oblique subterminal line, slightly greyish tinged. Hind wings, and under side of all the wings, fuscous brown.

Expanse, 24–30 millim.

Collection number, 1260.

Two male specimens. One from Suisha, July 21st, 1909, the other from Kanshirei, April 10th, 1908.

## DREPANIDÆ.

*Macrocilix misticata flavotincta*, ab. nov.

♀. Head white, thorax orange brown, collar and patagia yellow. Fore wings, upper part of band somewhat narrower than in typical *misticata*, and its dorsal extremity is orange brown shaded on each side with yellow. On the hind wings the tornal area is suffused with grey, obliterating the typical black marking.

Expanse, 48 millim.

Collection number, 1831.

A female specimen from Arizan, August, 1908.

## NOTES AND OBSERVATIONS.

FORMALDEHYDE USEFUL IN SETTING INSECTS.—I am interested to see Mr. St. John's notes on the use of formaldehyde in setting insects (Entom. xlvii. p. 325), as I have occasionally used it myself for some years past, being led to try it by the extreme rigidity of insects killed by its fumes. My method was to remove an insect from the setting board after 'initial set' had occurred, and lightly to touch the bases of the wings, where they join the body, with a camel-hair brush dipped in a 10 per cent. solution of formaldehyde, when the

insect was replaced on the board for two or three days longer. I wonder whether Mr. St. John has tried injection of a minute quantity of formaldehyde into the bodies of such species as *sparganii* and *ochracea*? I should imagine it would have the effect of preventing any flow of fatty or greasy matter, since I believe formaldehyde or formalin—(are these of precisely similar composition chemically?)—are used in testing butter, on glass slips, the hardening effect it produces being very striking. It may be possible to combine formalin with ether or some light spirit, as a vehicle, so that an injection would permeate the whole insect, and evaporate quickly, leaving behind the essential germicide, thus obviating the necessity of removing, cleaning, and replacing the bodies of certain species. Probably Professor Meldola could settle all these points offhand.—G. BERTRAM KERSHAW; 9, Victoria Street, Westminster, S.W.

ACRONYCTA STRIGOSA AND HADENA ATRIPLICIS IN HUNTINGDONSHIRE.—Several localities in Cambridgeshire have been mentioned where *A. strigosa* has been taken, but I see no mention of Huntingdonshire. When I began collecting I paid many visits to Somersham, in Huntingdonshire, and in 1874, 1875, and 1876, at sugar, I took both *A. strigosa* and *H. atriplicis*, the former generally three or four each evening, while *H. atriplicis* was one of the commonest insects at the sugar patches, often four or five on a tree trunk, and on looking at my diary I find I took thirty-eight one evening. I have not been to this spot since 1877, and so far as I know it has not been visited by any entomologist. I see no reason why they should not both be still taken there if worked for. Somersham is about six miles from Chatteris, a well-known locality.—JAMES KENWARD; 1, Norfolk Gardens, Lower Addiscombe Road, Croydon.

ACRONYCTA STRIGOSA, HADENA ATRIPLICIS, &c.—Mr. Thurnall's notes (Entom. xlvii. p. 313) anent *A. strigosa* are of interest. With regard to the plantation mentioned, this has been cited to me as a former locality for both *Hadena atriplicis* and *Acronycta strigosa* at sugar. I have never myself been able to determine the position of this plantation. There is one rather north-east of the village, if I recollect aright, but I believe this is all small holdings now. With regard to recent captures of *atriplicis*, there was a ridiculous lawsuit some years ago, arising from the visit of entomologists to Holme Fen, and I seem to remember that two or three *atriplicis* were taken on that occasion. Newman (Edward), I think, records the fact that years ago pupæ of *atriplicis* were so common that they used to be collected by boys and sold for feeding fowls. Concerning *Lalia cænosa*, the late Mr. Bailey, of Wicken, told me that he was in the Fen when Mr. Porritt took the last *cænosa*, and I think he said that Mr. Porritt exchanged it with him for some *Nascia ciliialis*, then very scarce. I should say that in some notes of mine on *strigosa*, appearing in the 'Entomologist' a short time ago, Mr. Bailey was accidentally referred to as the 'Rev.' Mr. Thurnall is no doubt aware that a Houghton and a Bailey still carry on the traditions of their respective families as entomologists at Wicken.—G. BERTRAM KERSHAW, M.Inst.C.E., F.E.S.; 9, Victoria Street, Westminster, S.W., December 7th, 1914.

AN AFTERNOON IN SOUTH EASTERN FRANCE.—At the end of July I started with a friend for a short walking tour in the Eastern Pyrenees; but the sudden outbreak of the war compelled us to return abruptly, after we had had no more than one afternoon's walk (on Saturday, August 1st), from Narbonne to Sigean. As we were on the high road nearly all the time we did little collecting, except during a brief halt for an hour in a clover field, where we took the following insects: *Pieris manni*, *Pontia daplidice* (worn), *Colias edusa*, *Pyrameis cardui*, *Melitæa cinxia*, *M. phæbe* (small), *Melanargia lachesis* (worn), *Satyrus circe* (worn), *S. fidia*, *Epinephela jurtina* (worn), *E. ida*, *Polyommatus thersites*, and two other "blues" which are too worn to identify with certainty, but are probably *P. medon* and *P. escheri*. We had an exciting week of it on our return, especially at Cette (where I was arrested as a suspected German spy, and, having no passport or papers of any kind, I had great difficulty in convincing the police of my bona fides), Lyons, Paris, and Le Havre. The insects I took will always have for me an interest far in advance of their real value: but my object in writing this note is to record the capture of these species, some of which, as I am told by Mr. Rowland-Brown, who kindly looked them over for me, are not common in South-eastern France.—F. A. OLDAKER, M.A., F.E.S.; The Red House, Haslemere, November 28th, 1914.

EUROIS OCCULTA IN ESSEX.—In reference to Mr. Stiff's note on the occurrence of *Eurois occulta* in Essex (Entom. xlvii. p. 323), it may interest him to know that the four specimens he mentions as having been captured near Leigh-on-Sea are by no means the first recorded Essex specimens. As long ago as 1869, Mr. Meldola ('Entomologist,' vol. iv. p. 325) says, "I took two fine specimens of this moth at sugar in Epping Forest on August 26th." Again, Henry Doubleday, in vol. v. p. 420, in sending a list of insects captured in his garden at Epping, says, "I also took *Calocampa vetusta*, and a very fine *Aplecta occulta*. It must be about twenty-five years since I took two specimens of this moth" [presumably at the same place]. On July 29th, 1883, I took a single specimen at rest on the trunk of an oak near Brentwood, and I was told some two or three years afterwards that it was not very scarce at sugar there, but I never had an opportunity of testing the truth of the statement. I may add that this specimen was of the pale southern type, whereas those recorded by Mr. Stiff, and taken not very many miles away, are all of the dark variety.—A. THURNALL; Wanstead, December 8th, 1914.

EUROIS OCCULTA IN ESSEX.—In the 'Journal of Proceedings' of the Essex Field Club (vol. i. p. xxii.) occurs the following passage in the report of the meeting of the club held on June 26th, 1880:—"Mr. Meldola exhibited *Aplecta occulta* (dark aberration), *Aplecta tincta* and *Noctua glareosa*, all captured in the woods near Woodford, some years ago. Mr. English remarked that *glareosa* occurred occasionally in some parts of the Forest, but that *A. occulta* was a great rarity. Mr. Doubleday had once bred a batch of thirty or forty specimens, but all of the grey tint common in southern specimens, whereas Mr. Meldola's example was similar to the dark



northern form of the moth." I myself took a dark specimen in fair condition on treacle in Lark's Wood here about fifteen years ago, but I cannot lay my hand at present on my note of the capture, so I cannot give exact date. I have the specimen still, however.—C. NICHOLSON; Hale End, Chingford.

NOTES FROM THE HASLEMERE DISTRICT FOR 1914.—The season this year has been in many ways an unusual one, so that the following brief note may be of interest. In the first place, I have to record *Agrotis vestigialis* (July 4th), *Eupithecia sobrinata* (July 17th), and *Pachys betularia* ab. *doubledayaria* (June 13th), as new to our local list; while *Chloroclystis coronata*, taken for the first time here last year, occurred again at the lamps on July 14th this year. Several interesting varieties have been taken or bred—a very dark specimen of the *capucina* variety of *Miselia oxyacanthæ* was taken at ivy blossom on October 16th: a pale yellow variety of *Amathes macilenta* on October 12th: a heavily banded form of *Xanthia lutea* on October 6th: a very varied lot of *Oporabia dilutata* were bred between October 21st and 26th, culminating in a fine ab. *latifasciata*: specimens of most of the forms of *Cidaria truncata* were taken on the lamps at the end of May, and a second brood was bred, but this latter showed little variation and the specimens were all of smaller size than the spring brood: many larvæ of *Bormia repandata* were collected in the spring, in the hope of breeding varieties, and in addition to a nice lot of minor variations a magnificent ab. *conversaria* emerged on June 21st. Many insects which are usually uncommon occurred in greater numbers this year, notably *Drymonia chaonia* (April 20th–May 22nd), and *Polyphloca ridens* (April 13th–29th). The former of these is usually far less common than *D. trimacula* = *dodonæa*, but this year we took only one of the last-named. The following species were also specially abundant: *Geometra papilionaria* (July 3rd–20th), *Euchloris pustulata* (June 20th–29th), *Eucosmia undulata* (June 29th–July 16th), *Metrocampa margaritana* (June 20th–July 11th) (which was also unusually large) and *Boarmia roboraria* (May 29th–June 30th). All these were taken at the lamps, and *Agrotis ypsilon* (October 12th–November 5th) was common, both at the lamps and on the ivy blossom. Among the less common insects which were taken either singly or sparingly were: *Notodonta trepida* (April 28th–May 19th–June 15th), *Habrosyne derasa* (June 29th–30th), *Palimpsestis fluctuosa* (July 21st), *Polyphloca flavicornis* (March 31st), *Pæcilocampa populi* (November 6th), *Drepana binaria* (June 5th), *D. cultraria* (May 27th), *Sarrothripa revarjana* (April 19th), *Mitochondria miniata* (July 20th–21st), *Cybosia mesomella* (July 11th), *Demas coryli* (April 21st–May 29th), *Tæniocampa gracilis* (April 15th), *Ochria aurago* (October 18th), *Lithophane sociâ* (October 10th), *Plusia moneta* (July 14th), *P. pulchrina* (June 19th), *Chesias rufata* (June 4th), *Euphyia picata* (July 20th), *Perizoma flavofasciata* (June 30th–July 11th), *Numeria pulveraria* (May 20th), *Ellopiâ prosapiaria* (June 21st), *Hygrochroa syringaria* (June 8th), *Gnophos obscurata* (July 11th), *Scodionia fagaria* (May 23rd).

On April 11th *Cucullia verbasci* emerged from a 1912 pupa; the larvæ of *Fimbria* were specially abundant in the spring, and larvæ of

*Vinula* were common in late June and early July. The larvæ of *Vanessa io* were in countless numbers about the middle of June, but they were very badly stung. I had a curious experience with four full-fed larvæ of *Phcosia dictæoides*: I beat them late in the afternoon of September 19th, and being hurried on my return home, put them for the night on a birch twig within a glass cylinder which rested on a wooden platform. When I came to look at them next morning, I found that the larvæ had lifted up the cylinder and crawled away. After the most careful search I found one attacked by a large spider in a corner under a fringe of carpet, but the others are still somewhere in my study successfully hidden. It is also perhaps worth noting that *Euchloë cardamines* and *Lycæna icarus* were distinctly scarce here this year, while there were not so many larvæ of *Vanessa urticae* as usual.—F. A. OLDAKER, M.A., F.E.S.; The Red House, Haslemere, December 1st, 1914.

THE REV. T. A. MARSHALL'S LOCALITIES.—Ever since the publication of tome neuvième of André's 'Species des Hyménoptères d'Europe and d'Algérie,' which treats of the first part of the Proctotrypidæ, in 1904, I have been intending to publish the meaning of the localities indicated beneath the cards upon which Marshall invariably mounted his Hymenoptera (and other insects). These indications invariably take the form of abbreviations, and the difficulty Mr. Lyle met in discovering the meaning of "St. A." (Entom. 1914, p. 261—of *separata*, a very mistaken method of pagination, p. 5) has occurred in a good many instances both at home and abroad: notably in M. l'Abbé J.-J. Kieffer's Proctotrypidæ, above-mentioned, where the actual abbreviations are reproduced seriatim in a good many instances, for what they are worth, because their meaning was unknown to the author! Hence it were well, surely, to place on record a list of these, which was kindly furnished to me by Mr. Marshall when presenting me with a collection of Palearctic Ichneumonidæ. It is dated "Ucciani, Corse, April, 1899":—

"Bfm. or Bfmg.—Botusfleming (Cornwall).

Nantes—France.

Rannoch—Scotland.

B. T.—Bishops' Teignton (Devon).

Govilon—on the Usk, near Abergavenny, South Wales.

N.—Nunton, near Salisbury (Wilts).

Bugbr.—Bugbrooke, near Northampton.

Cwthy.—Cornworthy, near Totnes (Devon).

C.—Cheltenham.

Groveley Wood—near Salisbury. [I have never heard of other entomologists collecting here. I myself visited the locality in June, 1911, and was charmed with it.]

L.—Leicester.

B.—Barnstaple (N. Devon).

M.—Milford Haven, in Pembroke.

I. of Wight—Hants.

Niton—Isle of Wight.

St. A.—St. Albans, Herts.

Bolt Hd.—Bolt Head in Devon.

B. Tn.—Bishops' Teignton (Devon).

Nantua—France (Aisne), Jura mountains.

Last—Lastingham (Yorkshire moors)."

These explanations will be especially useful in working through Marshall's collection of Braconidæ, in the British Museum, for every card bears one of the abbreviations; and I regret not furnishing the above information (which was equally at hand then as now) when remarking upon that collection at Entom. 1909, pp. 61 and 96.—CLAUDE MORLEY; Monks' Soham House, Suffolk, November 30th, 1914.

## OBITUARY.

WILLIAM WARREN, M.A., F.E.S.

Born at Cambridge in 1839. Died at Tring on October 18th, 1914.  
Aged 75 years.

Mr. Warren's interest in British Lepidoptera, evident even in early boyhood, continued active throughout his life. As he was a strenuous field-worker and keen observer, his acquired information concerning our Lepidoptera was extensive and thorough. Especially was this the case as regards the so-called "Micros"—the Tortricina and Tineina, in particular. His knowledge of the species in the families named was indeed great, not only of the imagines but of their early stages also.

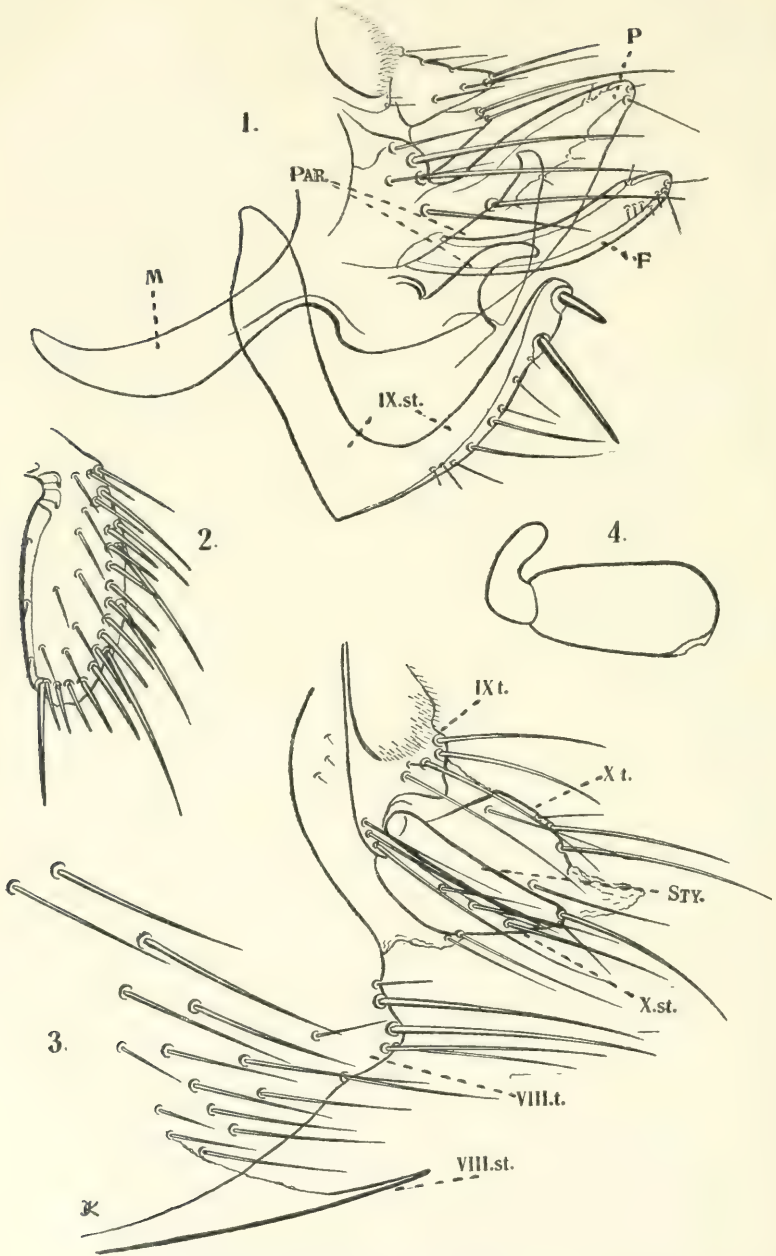
Unfortunately, Mr. Warren did not often publish the results of his observation and research, but most of those that he did record will be found in the 'Entomologist Monthly Magazine' for 1878–1889. His earliest communication (1878) deals with the economy of the larva of *Ephippiphora nigricostana*. The occurrence of *Laspeyresia* (*Stigmonota*) *pallifrontana* in England was noted by him in 1887, and in August of the same year he found larvæ of the species feeding in pods of *Astragalus glycyphyllos*. In 1887 also he published a note on the occurrence of both *Steganoptycha pymæana*, Hb. and *S. abiegana*, Dup., in England. The latter he identified as identical with Haworth's *Tortrix subsequana*.

When the late Mr. J. H. Leech acquired the 'Entomologist' in 1890, Mr. Warren was invited to act on the Reference Committee. This he consented to do, and from that year until 1900 he took an active interest in the journal, and contributed to its pages.

Although he never lost touch with his special groups of British Lepidoptera, Mr. Warren had for years past devoted much time to the study of the Geometridæ of the world. More than a quarter of a century ago he undertook and carried out the arrangement of this family, and also the Pyralidæ, in the British Museum. Subsequently his sphere of activity was transferred to the Tring Museum, and here during the greater part of some twenty years he encompassed a great amount of work on the lepidopterous fauna of New Guinea, South America, Africa, &c., the results being published in 'Novitates Zoologicæ.' More recently his work was pretty much confined to the Palearctic Noctuidæ, which formed the subject-matter of the third volume of Seitz's 'Macro-Lepidoptera of the World.'







*STEPHANOCIRCUS PECTINIPES*, SP. NOV.

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## STEPHANOCIRCUS PECTINIPES, SP. NOV.

By THE HON. N. CHARLES ROTHSCHILD, M.A.

(PLATE II.)

♂ ♀. Similar to *S. simsoni*, but at once recognised by the outer bristles of the dorsal and apical edges of the tibiae forming a comb.

*Head*.—The helmet is nearly the same as in *S. simsoni* (cf. Ent. Mo. Mag. (2) xvi. pl. 1, fig. 3), but the comb contains on each side from seventeen to twenty spines; the bristles behind this comb also as in the figure cited. The genal comb consists of six or seven blunt spines and a long pointed spine placed behind the vestigial eye. The occiput is twice as long as the helmet (inclusive of the comb) is wide at the fifth spine. The second segment of the maxillary palpus is as long as the first and about one-third longer than the third segment. The apical segment of the proboscis is very short, being twice as broad as it is long. The bristles of the second segment of the antenna are longer than in *S. simsoni*, nearly all reaching to or beyond the apex of the club.

*Thorax*.—The pronotum bears three rows of bristles, and the meso- and metanotum each four rows, the mesonotum having additional bristles in front. The meso-pleura have fifteen to twenty-five bristles, the episternum of the metathorax five or six, and the metepimerum six to ten bristles in the first row, and five or six (usually five) in the second.

*Abdomen*.—The tergites bear two rows of bristles and (particularly in the female) some additional bristles representing a third row; the eighth tergite has bristles above the stigma in both sexes. The basal sternite bears two or three ventral bristles placed one behind the other, and further back two or three lateral ones; sternites III. to VII. of the male bear a row of four or five bristles on each side and several additional bristles in front of the row, VIII. has a row of four, and four to eight additional bristles; in the female the bristles on the sternites are more numerous, sternite VII. bearing a row of eight or nine bristles and before this row another of seven to nine, on each side.

*Legs*.—The fore femur has on the outer surface about four lateral bristles, besides the subventral ones which are placed near the apex. The outer dorsal and apical bristles are nearly of equal length and

form a continuous comb which is not interrupted at the apex (fig. 2). The bristles on the outer surface of the hind tibia are almost evenly distributed between the ventral and dorsal edges.

*Modified Segments.*—♂. The manubrium (M) of the clasper (fig. 1) is widest in the centre. The clasper bears two large and two smaller bristles at the proximal dorsal angle, and two long bristles further down; the process (P) of the clasper as well as the movable process (F) are slenderer than in *S. simsoni*. The horizontal arm of the ninth sternite (ix. st.) is narrower than in *simsoni*; its stout apical bristle is half as long as the subapical one, the latter being longer than in *simsoni*. The anal tergite bears a dorsal median row of three or four bristles and a lateral row of two or three, the last bristle of each row being placed at the apex of the segment.—♂. The eighth tergite (VIII. t.) has a row of four to six bristles above the stigma, the row being continued down to the ventral margin of the tergite, and accompanied by another row, there being additional bristles near the ventral and at the apical edges, the segment having thirty to thirty-four bristles altogether on each side. The apex of the segment is less pointed than in *simsoni*. The ninth tergite (ix. t.) has two or three bristles close to the base of the stylet (Sty.), which is long, cylindrical and slightly curved, and an apical row of four on each side. The anal tergite (x. t.) bears two long dorsal bristles accompanied as a rule by one or two small bristles, and has one lateral bristle; the sternite (x. st.) bears on each side a row of three bristles at the dorsal margin, and one or two bristles ventrally. The head of the receptaculum seminis (fig. 4) is twice as long as it is broad, being also much longer than the tail.

A series of both sexes from Emerald, Victoria, obtained on *Epimys assimilis* by Mr. Ed. Jarvis.

EXPLANATION OF PLATE.—Fig. 1. Male organs of *Stephanocircus pectinipes*; M. = manubrium; P = non-movable process of clasper; F = movable process of clasper; ix. st. = ninth sternite; Par. = parameres of penis. Fig. 2. Fore tibia (of male). Fig. 3. Last three abdominal segments of female; t. = tergite; st. = sternite; sty. = stylet. Fig. 4. Receptaculum seminis.

## THE BUTTERFLIES OF THE BUCKS. CHILTERN.

By H. ROWLAND-BROWN, M.A., F.E.S.

PRIOR to the extension of the Metropolitan Railway to Aylesbury, the greater part of the country with which these observations are concerned was, entomologically speaking, *terra incognita*. The Chiltern Hills bisect the county of Buckinghamshire at its narrowest east and west borders; that is to say, from the point where Hertfordshire is driven wedge-like north-west of Tring as far as Wingrave, to the eastward face of Bledlow Ridge looking towards Princes Risborough, and round to the Wycombes. Though to-day something of suburban London has followed the line even as far away as this, there still remains, and is likely to

remain, an unspoilt land of chalk down and beech forest, dividing the Vale of Aylesbury from the gravel and clay lands of the southern division—hardly less beautiful in their way than the Chilterns themselves. I first made acquaintance of it when the “safety” cycle gave access to “fresh woods and pastures new,” that is to say, about 1896; and since then no year has passed that I have not spent one or two days in spring, in summer, and in autumn with the Chiltern butterflies and other day-flying Lepidoptera. Latterly, I understand, collectors from the north have camped among them under canvas, and I venture to hope, therefore, that the publication of these remarks will induce a supplement to my records; for, despite the exquisite nature of the uplands and forest of the locality under review, I can find in the magazines and reports of our Natural History Societies but scanty notices even of the butterfly fauna.

In the mid-Victorian period, the Rev. Joseph Greene, author of the entertaining ‘Insect Hunter’s Companion,’ worked Halton. He is quoted by Stainton in his ‘Manual of British Butterflies and Moths’ (1857), by whom also several species are reported from Wavendon, near Newport Pagnell, beyond the scope of my immediate investigations. At the same period, and later, the Rev. H. Harpur Crewe, the well-remembered authority on the Eupithecias, and a frequent contributor to the ‘Entomologist,’ interested himself with the Lepidoptera of Drayton-Beauchamp and Aston-Clinton, at the extreme eastern edge of the Bucks. Chilterns. His observations are recorded in Newman’s ‘British Butterflies,’ which bears no date on the title cover, but was published, I believe, in 1871. Between this and the coming of Tutt’s monumental ‘British Lepidoptera,’ no systematic attempt appears to have been made in an entomological work to collate the Chiltern butterflies, though there are occasional notices of the neighbourhood to be found in this and other entomological magazines to which I may draw attention,\* as well as Mr. Barrett’s list in the ‘Victoria History of Buckinghamshire.’

It is not my intention to particularise localities explored. As long as a commercial value attaches to specimens, the evil of too intimate directions is obvious. I will say this much, however, that my personal knowledge, such as it is, is confined to the section of the Chilterns which unites Wendover with the Wycombes, and the gradual sloping country southward as far as the Chalfonts.

A more diversified landscape it is difficult to imagine. The one feature lacking is water, and in dry seasons, such as those of 1893, 1911, and 1914, the pastures and downs suffer

\* *E.g.* “Contribution to the List of Macro-Lepidoptera of Bucks.,” E. W. Carlier, M.D., B.Sc., ‘Entomologists’ Record,’ vol. xxi., pp. 285–6. “List of August Diurni” (*id.* vol. xxii., pp. 44–45). Mr. Kenneth Raynor does not deal with that part of the county described by me here.



grievously. But there are a certain number of springs, on the north face, and, as a rule, an abundant chalk-flora outside and in the clearings of the beech woods, which still cover a considerable area towards the west. I see it stated that Buckinghamshire gets its name from the Anglo-Saxon "boc," or beech woods. There are secluded spots in the foothills which retain apparently their primitive aspect in every detail. In such places the space between forest fringe and meadow, or more usually arable land, is sprinkled with dwarf juniper and ancient thorns; the steep flinty roads are banked with helianthemum, scabious, and occasional hedges of viburnum. Here and there the side wastes have been enclosed with barbed wire to contain the sheep in places where the grass affords pasture, mingled with *hippocrepis*, burnet-saxifrage, and aromatic wild thyme. In the occasional open spaces, or by the cart-tracks used for wood cutters, there is an abundance of wild strawberries; and, while in July tall thistles are certain lure for the larger Fritillaries, a month later clumps of hemp agrimony invite the commoner Vanessids to their familiar banquet.

On the south side, dropping from Great Hampden, or along the Wendover road to Great Missenden, the woods give way to ploughed fields, sometimes a glory of scarlet poppies, at other seasons gay with the delicate pink spires of sainfoin, or duskier lucerne. At other spots the gentle slopes are a blaze of mustard splashed with the "dragon's blood" of luscious Dutch clover. The lesser copses are fringed with holly, and where the main road from Aylesbury reaches to Missenden the cherry orchards begin, thence in April an unbroken line of snowy blossom to the limit of the lighter soils; as beautiful as the stretches of blackthorn later laden with large and bloomy sloes. Motors and motor dust have done much to spoil the amenities of the great highways; still, Saturdays excepted, the Chiltern by-roads are as peaceful and as pleasant as those of the Alps. Also, much likely-looking ground is enclosed and private; but from east to west there are country lanes unrivalled in mid-England for luxuriance of wild flowers and fruits; open downs and wood land, where it seems you may wander at will undisturbed by "trespass" boards, and the ever unwelcome keeper. We entomologists, however, owe not a little to the game preserver, and I quite agree with my correspondent Mr. A. J. Spiller, who has given me so much valuable help in compiling this Buckinghamshire list, that the real reason why certain once common species tend hereabouts to become "small by degrees and beautifully less" is directly traceable to the grazing of the hills by sheep in places formerly reserved for sporting purposes. And, as proof of this, otherwise rare insects are still locally plentiful where the various grasses and chalk-loving flora are left to flourish at their own sweet will.

## HESPERIIDÆ.

1. *Hesperia malvæ*, L. This butterfly is hardly common at the outskirts of the beech woods. The under sides vary considerably in colour from sage green to deep crimson, suggestive of *Pyrgus sao*. I have never come across a true example of *ab. taras*, Brgrstr., but the *intermedia*, Schilde, form is not unusual, and I have several *ab. scabellata*,\* Reverdin, in which the spots on the inner margin of the fore wing are united near the margin with a white streak. Is fond of sitting on last year's dead beech leaves in sunny spots.

Earliest date of appearance, May 17th, 1912; latest observed, June 21st, 1902.

2. *Nisoniades tages*, L. In some seasons extremely common, affecting the warm banks in the chalk lanes, and again the lush green grass on waste places. I am surprised to find I have no record in my diaries of an autumn emergence, but I am sure in very hot summers I have come across individuals of a second brood. Mr. Spiller reports a second brood in 1914.

Earliest date, May 11th, 1912; latest (first brood) observed, June 22nd, 1908.

3. *Augiades sylvanus*, Esp. Common on both sides of, and throughout the range, but more so on the south slopes.

Earliest date, June 9th, 1900; latest observed, August 1st, 1906.

4. *A. comma*, L. Another Hesperiid which varies largely in relative abundance. Some years I meet with only a few scattered specimens. (I have generally been abroad at the normal time of appearance in July.) Occasionally it swarms, as in August, 1906. Mr. B. C. S. Warren tells me that he caught "very fine" *ab. catena*, Stgr., between August 9th-15th, 1911. The Hon. N. C. Rothschild reports it from Drayton-Beauchamp, in the eastern extremity of the region; Mr. Spiller, and Mr. Peachell have informed me that it extends well westward in the High Wycombe direction, and to the Oxford Chilterns.

Earliest date observed, July 8th, 1899; latest, September 3rd, 1898. Mr. South records an example at Wendover as early as July 6th, 1893 (Entom. xxvi. p. 252).

[*Adopæa lineola*, Ochs. Neither I nor my several correspondents have yet turned up this species in Bucks. Mr. Warren writes: "I have no *lineola*, probably because I did not take much trouble hunting for them." I have no doubt that a careful

\* *Ab. scabellata*, Reverdin. As this aberration has not been described or figured to my knowledge in an English work, I venture to supply the following translation from the original description (Bull. Soc. Lépid. Genève, vol. ii. p. 153):—The white spot nearest the inner margin of the median band of the fore wings united by a white dash to the corresponding white spot of the basal series (as in *H. alveus ab. lineolata*, Rev., *ibid.*, p. 152). The whole arrangement may be compared in shape to a footstool (*escabeau*) turned upside down with its feet in the air.

search at the right season would be rewarded. It occurs in the neighbouring counties of Northants. and Beds.]

5. *A. flava*, Brunn. (*thauwas*, Hufn.; *linea*, F.). This Skipper is at its best from the middle to end of July, when I have seldom visited the ground where it occurs, as a rule rather sparsely compared with *A. comma*. It seems, however, to be generally distributed from the Wycombes to Drayton-Beauchamp. Mr. Warren reports it common, July 18th, 1908.

Earliest date observed, July 15th, 1899; latest, August 21st, 1909.

#### LYCÆNIDÆ.

6. *Chrysophanus phlæas*, L. Rather irregular in relative abundance. In some years an undoubted third brood. I take the ab. *cæruleopunctata*, Stgr., not infrequently.

(a) *gen. vern.* Earliest seen, May 9th, 1912.

(b) *gen. æst.* Earliest seen, July 8th, 1899.

(c) *gen. autumn.* First seen, September 27th; last seen, October 9th, 1913: but no doubt in this year it was flying much later, as I saw it in Middlesex into November.

7. *Cupido minimus*, Fssl. For some years I did not find the limited locality where this butterfly occurs in the part of the Chilterns then known to me. Here the food-plant, *Anthyllis vulneraria*, grows in some abundance, and I usually come across a fair number of examples. *Minimus* is distributed locally from one end of the region to the other, and Mr. A. J. Spiller reports a partial second emergence in the west, in 1914. This I have never noticed in Bucks., but I had no opportunity to visit the ground in the hottest of all recent summers, 1911.

Earliest date observed (a single male), May 22nd, 1914; latest, July 2nd, 1908. (To be continued.)

*Note.*—I shall be much obliged if collectors who are acquainted with the butterflies of this region will communicate with me.

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## ON THE HYBRIDS OF THE GENUS *OPORABIA*, WITH SOME NOTES ON ITS MICROGENES.

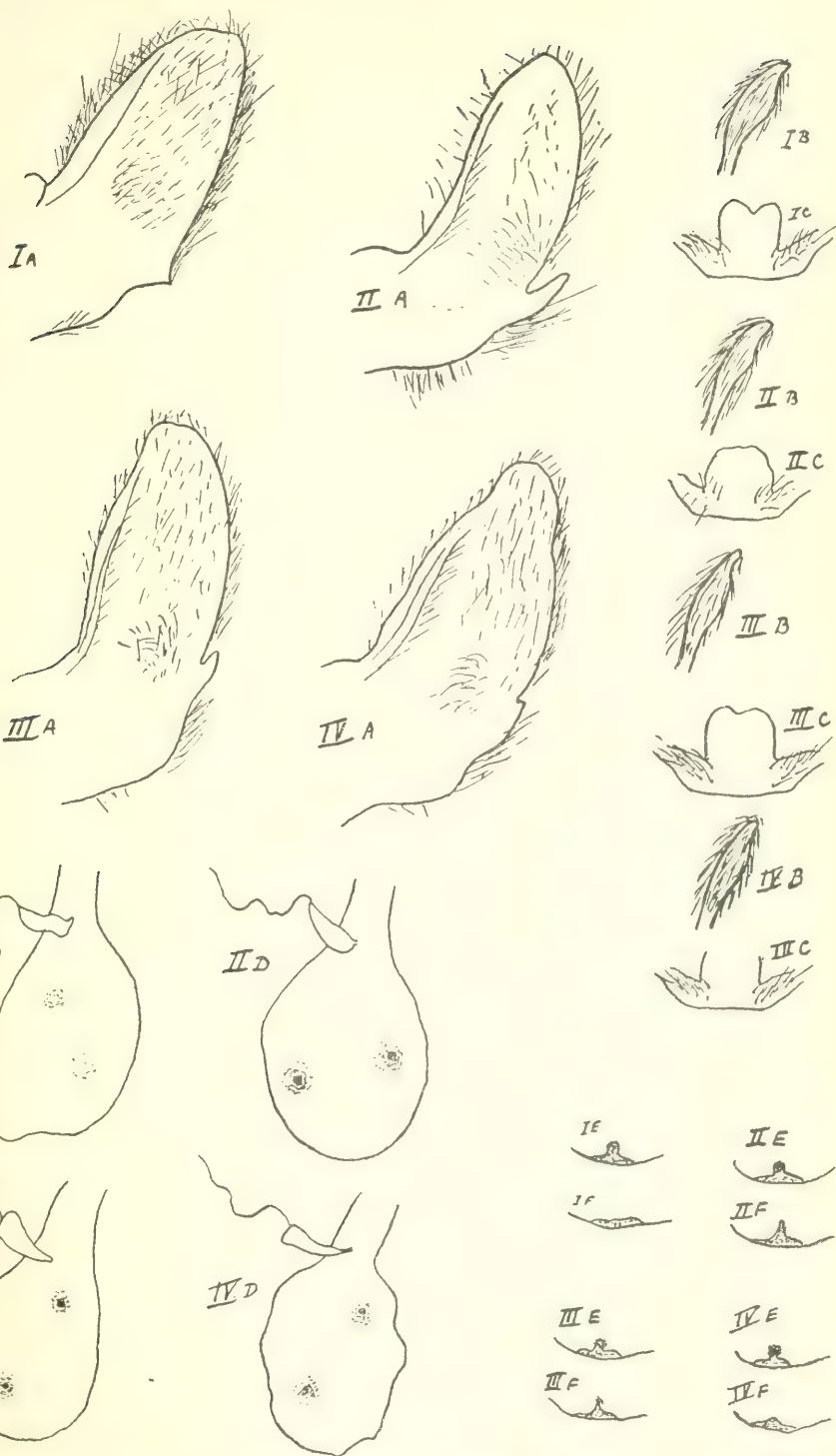
By J. W. H. HARRISON, B.Sc.

(PLATE I.)

(Continued from p. 6.)

THIS acceleration of development is not always found to result in degenerate germ cells,\* and therefore the above suggestions are not a complete explanation. In this case the observation is not without its value in suggesting the possible

\* Such as I have found in rearing *Drepana rebeli* = *D. falcula* × *D. curvatula*.



DETAILS OF GENITALIA OF *OPORARIA AUTUMNATA* AND *O. DILUTATA* AND THEIR HYBRIDS.  
(Explanation at end of paper.)





origin of some species. Suppose a mutation of a species to arise through some disturbance in the normal behaviour of the chromosomes; let this mutation cross with the parent form; imagine the difference in rate of metabolic change to result in precocious development of the resulting imagines. There would then result a number of insects emerging some time before the parent, and not necessarily sterile. They would, however, be effectually separated from the original form by a certain space of time. They would thus be saved from being swamped, and differing, as was granted, in the chromosomes, they must in the process of time be regarded as a "new species." If such be the origin of some species, we ought to be able to find pairs of closely allied species separated from each other by the time of emergence. Such pairs we see in *Biston strataria* and *Amphidasis betularia*, and *Tephrosia (Ectropis) bistortata* and *T. crepuscularia*.

Let me now take up point two.

That the accelerated form resembles a melanic *dilutata* may be a consequence of that acceleration. It may be possible that, in *dilutata*, when once the imago commences to develop, it forms at a much more rapid rate than in *autumnata*, although the periods of the commencement of development may not coincide, for, as a matter of fact, *autumnata* commences to develop first. The acceleration produced otherwise in the females may cause the *dilutata*-ness of the hybrid to overpower to some extent its *autumnata*-ness. However, it is not, I think, to this we have to look for our explanation, but to the constitution of the parent gametes.

Experiment has shown that, as regards sex, in the Lepidoptera one of the two sexes is heterozygous.\* The bulk of the evidence shows that it is the female that is heterozygous and the male homozygous. In *Saturnia*, however, I have definite evidence that it is the male that is heterozygous, whilst, in the *Bistoninae*, the weight of the evidence is in favour of the view that the female is heterozygous.

Suppose in the genus *Oporabia* that the male is heterozygous and has the composition ♂ ♀, † whilst the female is homozygous and is represented as ♀ ♀. Imagine, too, that the form of *dilutata* used is melanic, and therefore carries a factor for melanism. Let us further suppose that, in the gametogenesis, there is a kind of false allelomorphism between maleness and the melanic factor, and that they repel each other. Spermatozoa would thus be formed of two kinds, one carrying femaleness and melanism (♀ M), ‡ and the other maleness and no melanic factor (♂ N).‡ The females, on the other hand, would give ova

\* Castle (Bull. Mus. Comp. Zool. Harvard, 1903, vol. xl. No. 4) says that possibly both sexes are heterozygous in some forms in this respect.

† Maleness being regarded as dominant.

‡ M is used to represent the presence of a factor for melanism; N denotes its absence.

all of the same type represented as ♀ M. On fertilization we should have two types of zygotes formed, one of the composition ♀ ♀ M M, and therefore a melanic female, and the other ♂ ♀ M N, and therefore male, and possibly showing diluted melanism. Introduce now a female not bearing the melanic factor. Its gametes would be ♀ N and ♀ N. Fertilization with a melanic male, yielding gametes ♂ N and ♀ M, would give zygotes of the composition ♂ ♀ N N, which are non-melanic males; and zygotes, represented as ♀ ♀ M N, which would be females melanic or diluted according to the greater or less dominance of the melanic factor. Such a procedure was adopted in the cross *dilutata* ♂ × *autumnata* ♀. The female hybrid bore melanism, and the male was without it; results just as one would predict from the above scheme.

In the reverse cross we have *autumnata* males of the form ♂ ♀ N N, and *dilutata* females represented as ♀ ♀ M M taking part; these would yield in the former case the gametes ♂ N and ♀ N, and in the latter gametes all ♀ M. Fertilization then would give zygotes of the form ♂ ♀ M N and ♀ ♀ M N, i.e. both zygotes are heterozygous, as far as melanism is concerned. This heterozygousness is probably shown by the suffused and blurred out-of-focus effect in both sexes of hybrid *rungei*, and again the actual results agree with the predicted ones.

Concisely, the results can be shown as follows:—

(I)		<i>dilutata</i> ♂ × <i>autumnata</i> ♀	
Composition		♂ ♀ M N	× ♀ ♀ N N
gametes		$\left\{ \begin{array}{l} \text{♂ N} \\ \text{♀ M} \end{array} \right.$	Both ♀ N
F <sub>1</sub> Non-melanic males		More or less melanic females	
♂ ♀ N N		♀ ♀ M N	
(II)		<i>autumnata</i> ♂ × <i>dilutata</i> ♀	
Composition		♂ ♀ N N	× ♀ ♀ M M
gametes		$\left\{ \begin{array}{l} \text{♂ N} \\ \text{♀ N} \end{array} \right.$	All ♀ M
F <sub>1</sub> More or less melanic males		More or less melanic females	
♂ ♀ M N		♀ ♀ M N	

I have undertaken experiments, within the limits of the same species, to confirm the above views; these are not yet complete, but I can say that the results obtained are not inconsistent with the views here propounded.

Lastly, it is easy to see in the greater potency of *autumnata* the usual experience one has in similar experiments, that the phylogenetically older species has the greater effect on the hybrid produced, and that *autumnata* is the older form I have already shown.

TABLE I.—MICROGENES OF OPORABIA AUTUMNATA.

	<i>O. autumnata autumnata.</i>	<i>O. autumnata filigrammaria.</i>	<i>O. autumnata alicoiaria.</i>	<i>O. autumnata pinivoraria.</i>
OVA.				
Description	Salmon pink; pitted ridges marked but pits shallow	Much the same; * colour duller	More purple; longer and narrower; depression large, pits smaller, and more numerous	Smaller and not so pink
Hatches †	Date varies	Hatches much earlier	Hatches about ten days earlier	Hatches about a fortnight earlier
LARVÆ.				
Description	Green, dull, with faint suggestion of grey	Darker green, sometimes mottled; head smoky, smaller	Very bright green; newly hatched larva a little longer	Green, but may be marked with rusty markings to mimic pine buds; not purple like <i>dilutata</i>
Food ....	Birch and alder	<i>Calluna, Erica, Vaccinium</i>	Alder and birch	Pine and larch
Pupates ‡	Last	First	Third	Second
IMAGINES.				
Emerges §	Oct. 8th–Nov. 10th	Aug. 20th–Sept. 20th	Sept. 23rd–Oct. 23rd	Sept. 16th–Sept. 30th
Markings and size	Ground, often white, varies to grey; when melanic black-brown with subterminal line paler; markings generally distinct; female fairly large	Colour the same; markings heavier and clearer, especially on hind wings; ground rarely suffused; glossier; smaller; wings narrower; female smaller in proportion	Ground brown, but grey mixed; markings more delicate, but still firm; central area very broad, duller; larger, and females in proportion larger still	Males always suffused and feebly marked; females very small, generally well marked; when melanic, blue-black
MALE GENITALIA.				
Octavals	Not large, widely apart; depression between shallow	Nearer; depression deeper	Larger; nearer depression shallow	Much the same
Cristæ ¶	About 19	About 7	About 14	About 19
Labides **	Head wide, with thin hairs	Head narrow, with thin hairs	Head narrow, with thin hairs	Head wide; very densely clothed with hairs
FEM. GEN.				
Signa †† of Bursa copulatrix	Small and scobinate	Larger	Larger	About the same

\* Wherever comparisons are made they are with *O. autumnata autumnata*.

† Ova out of doors but not in nature.

‡ Wild larvæ.

§ Wild imagines.

|| Chitinous projections on 8th sternite.

¶ Patch of stiff hairs on juxta.

\*\* Pair of rods, with a head bearing fur in these species, rising from the chitinous bar extending from costæ of valves.

†† Chitinous armature of bursa.



TABLE II.—MICROGENES OF *OPORABIA DILUTATA*.

	<i>O. dilutata dilutata.</i>	<i>O. dilutata christyi.</i>	<i>O. dilutata fraxinaria.</i>
OVA.	Description .. Glossy, ruby in colour, pitting feeble	A little smaller, * glossier	Slightly smaller
	Hatches .... Varies	The same	Earlier
LARVÆ.	Description .. Green, often purple-marked	The same	Always green
	Food ..... Oak, &c.	Birch, &c.	Nearly always ash
IMAGINES.	Emerges .... Middle of October & onward	The same	Sept. 30th–Oct. 20th
	Markings, size, &c. Ground very variable. Discal point large; angle of elbowed line rounded; sweeps near discal point	Ground whitish generally. Discal point small; angle of elbowed line almost as near a right-angle as in <i>autumnata</i>	Much smaller, ground bluish-grey, glossier. Practically no markings; parallel to <i>O. autumnata pinivorraria</i> . Is not, however, melanic
MALE GENITALIA.	Octavals .... Far apart	Very near	As in <i>christyi</i>
	Labides .... Head narrow	Head wide	Intermediate
	Valves ..... Spined externally	Shorter; spine more hooked	Much as in <i>dilutata dilutata</i> , but smaller

EXPLANATION OF PLATE OF GENITALIA.—I. *autumnata*; II. *dilutata*; III. hybrid *robsoni*; IV. hybrid *rungei*. A. Valve; B. Head of labides; C. Juxta and Cristæ; D. Bursa copulatrix with signa and Ductus seminalis; E. Upper signum; F. Lower signum.

## NEW SPECIES OF HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### NOCTUIDÆ.

#### *Micreremites bidentata*, sp. n.

♂. Fore wings whitish, with a faint ochreous tinge; antemedial line black, sinuous, a black line from it to base of the costa; postmedial line black, sinuous, the sinus enclosing black discoidal spot bidentate; subterminal line pale, sinuous, inwardly bordered with black, area beyond the line suffused with blackish; terminal line black, lunulate; fringes grey, white at base. Hind wings whitish, fuscous

\* Comparisons with *O. dilutata dilutata*.

tinged; discoidal lunule and two transverse lines beyond blackish, the first line bent inwards below cell, the second line from costa near apex to termen above tornus; terminal line blackish, lunulate; fringes white marked with grey towards the costa, greyer towards tornus. Under side whitish, suffused and clouded with fuscous, chiefly on the fore wings; discoidal spot black, placed on a blackish undulated line on fore wings; the hind wings have a black discoidal spot, a blackish line beyond, and a diffuse blackish band between the line and the termen.

Expanse 20 millim.

Collection number, 1031.

Two male specimens from Arizan (7500 ft.). One taken September 27th, 1906, the other August 8th, 1908.

Comes near *M. rasalis*, Warren.

*Bertula albiguttata*, sp. n.

♀. Head and thorax brown, abdomen brown mixed with greyish. Fore wings grey-brown, faintly reddish tinged; antemedial line blackish, slightly excurved; postmedial line blackish, outwardly oblique from costa to vein 6, thence wavy and inwardly oblique; a white dot in the cell, and a white lunule followed by three white dots at outer end of the cell; subterminal line whitish, most distinct on costal area, where it is incurved and edged with black; a short oblique black streak from apex. Hind wings pale brown, sprinkled with darker; a diffuse blackish band before the middle, terminal area clouded with blackish; subterminal line indicated by blackish edged-white points. Under side fuscous; all wings have a blackish discoidal spot and dusky line beyond.

Expanse, 30 millim.

Collection number, 1405.

A female specimen from Kanshirei, April 29th, 1908.

There is a male from Kanshirei (Wileman) in the British Museum. Except that the antennæ are fasciculated, this specimen agrees with the female now described. It was captured in November, 1908.

*Adrapsa mediana*, sp. n.

♂. Fore wings brown clouded with fuscous; discoidal lunule white, slender, preceded by a blackish transverse shade; postmedial line white, wavy, bent inwards at costal extremity, the outer border broadly dusted with white; subterminal line pale, sinuous, marked with white at costa and above the middle, area beyond dusted with white; terminal line black, lunular; fringes brown marked with white. Hind wings brown clouded with fuscous; medial line white, almost straight, followed by a band of white dusting; subterminal line white, wavy, indistinct; terminal line black, lunular, preceded by some white dusting; fringes as on fore wings. Under side of fore wings pale grey brown, finely sprinkled with darker; discoidal lunule whitish, preceded by a dark cloud and followed by an almost straight, dusky postmedial line; terminal area black-brown, with a patch of the ground colour below apex; of hind wings pale grey

brown, antemedial and medial lines black brown, interrupted; discoidal lunule whitish, edged with black-brown; subterminal line pale, wavy, broadly bordered inwardly with black-brown and followed by a dusky transverse line.

♀. Similar but rather darker, and there is less white powdering on the termen of the fore wings.

Expanse, 30 millim. ♂; 28 millim. ♀.

Collection number, 1431 ♂ and 1006 ♀.

One male specimen and two females from Kanshirei. One female was taken on June 16th, 1906, the male on April 9th, 1907, and the second female on September 1st, 1908.

Allied to *A. ablualis*, Walk., the type of the genus *Adrapsa*.

*Nodaria terminalis*, sp. n.

♂. Head and thorax pale brown, mixed with grey, abdomen paler; antennæ ciliated with paired bristles. Fore wings pale brown with greyish suffusion; terminal fourth dark brown; antemedial line dark brown, wavy, indented below costa; postmedial line dark brown, outwardly oblique from costa to vein 6, thence wavy and sinuous, preceded by a dark shade; subterminal line pale brown, dotted with black, almost straight; dots on termen black, fringes brown-grey mixed. Hind wings pale fuscous, suffused with darker, especially on basal area; discoidal spot and medial line blackish, the latter limiting the darker basal area; subterminal line blackish outwardly edged with whitish, sharply angled before the tornus; terminal line black, fringes brown paler at the base. Under side of fore wings fuscous brown; discoidal dot, postmedial and subterminal lines black, the subterminal rather indistinct: of hind wings pale brown sprinkled with black; discoidal mark and two lines beyond black, the inner line wavy and the outer line indented before tornus.

Expanse, 30 millim. ♂; 32 millim. ♀.

Collection number, 1435.

One example of each sex. The male from Punkio (4000 ft.), August 4th, 1908, and the female from Karapin (3000 ft.), August 1st, 1908.

Allied to *N. centralis*, Zuch.

*Nodaria* (?) *apicimacula*, sp. n.

♀. Head, thorax, and abdomen pale brown mixed with darker. Fore wings pale brown dusted with darker, chiefly on the basal and terminal areas; a black dot on the cell and two dots at end of the cell, the latter placed on a dusky transverse shade; antemedial line black, slender, deeply indented below costa, inwardly oblique towards dorsum; postmedial line black, slender and wavy; subterminal line pale, indistinct; towards costa interrupting a broad oblique black dash from apex, preceded by black marks which increase in size towards dorsum; terminal line black, lunular; fringes grey brown, paler at base and tips. Hind wings pale brown dusted with darker, chiefly on basal and terminal areas; two black discoidal dots set in a dusky transverse shade; postmedial line black, thicker than that

on the fore wings; subterminal line pale, inwardly marked with black; terminal line and fringes as on fore wings. Under side pale brown, with most of the black markings of upper side reproduced, but these only faintly on the fore wings.

Expanse, 28 millim.

Collection number, 1022.

Two female specimens from Kanshirei, one taken May 2nd, 1907, and the other April 29th, 1908.

There is a rather rubbed male from Formosa (Wileman) in the British Museum. In this specimen the markings of the fore wings are only faintly traceable.

*Nodaria unipuncta*, sp. n.

♂. Head and thorax pale ochreous brown, abdomen paler. Fore wings pale ochreous brown, a black spot at end of the cell: antemedial and postmedial lines dark brown, the former wavy and the latter slightly excurved, both indistinct; traces of a dusky subterminal line and minute black dots on the termen. Hind wings whitly-brown, suffused with darker brown. Under side whitly-brown, fore wings suffused with darker; all the wings have a dusky discoidal dot and a transverse line beyond.

Expanse, 35-38 millim.

Collection number, 1426.

Two male specimens from Kanshirei, April 29th, 1908.

There is a female of this species from Kanshirei (Wileman) in the British Museum. It is of a deeper ground colour, and the subterminal line is dark brown outwardly edged with paler, and nearly straight. This specimen was taken in June, 1908.

*Nodaria interrupta*, sp. n.

♀. Fore wings pale ochreous brown, clouded and suffused with darker brown, except on the basal and three-fourths of the costal areas; antemedial line black, sinuous, bisecting two white spots; postmedial line black, outwardly oblique from costa to a white mark at end of the cell, thence inwardly oblique and wavy to the dorsum; discoidal lunule black, placed on the inner edge of the white mark; subterminal line white, sinuous and interrupted, outwardly edged with black towards the costa; terminal dots black; fringes grey-brown marked with paler. Hind wings whitish with blackish discoidal lunule and two transverse brownish bands beyond, neither band extending to the costa, the outer one edged outwardly with white and angled above dorsum; subterminal line dark brown, fringes whitish fairly marked with grey brown. Under side of fore wings pale ochreous brown sprinkled with darker brown, and suffused with fuscous on the disc; discoidal lunule and postmedial line black, the latter only distinct on the costal area; white markings on costal half as on upper side; hind wings white finely freckled with brown, discoidal lunule black; medial and postmedial lines blackish, serrate,



commencing in black spots on the costa, and marked with black opposite the cell.

Expanse, 25 millim.

Collection number, 1019c.

A female specimen from Arizan (7500 ft.), September 10th, 1906.

Near *N. duplicinota*, Hampson.

*Nodaria rivulosa*, sp. n.

♀. Fore wings pale brown, heavily powdered with darker brown; antemedial line black, wavy; postmedial line black, the upper part outwardly oblique, united with the black discoidal mark, lower part wavy and inwardly oblique; subterminal line whitish, highly sinuous, shaded inwardly with black; terminal line black-brown, fringes whitish marked with grey-brown. Hind wings pale fuscous, suffused with darker; traces of two dusky transverse lines, the outer line angled towards tornus and outwardly edged with white; terminal line black-brown, fringes whitish, marked with grey-brown. Under side of fore wings dark fuscous; postmedial line black, excurved; an almost round blackish spot, followed by some whitish marks, below costa indicate the subterminal line: hind wings whitish sparingly sprinkled with brown; discoidal spot black, two brownish transverse lines beyond.

Expanse, 22 millim.

Collection number, 1019c.

A female specimen from Arizan (7500 ft.), August 23rd, 1908.

Allied to *N. simplex*, Hampson.

*Bomolocha taiwana*, sp. n.

♂. Head and thorax dark brown, paler mixed; abdomen pale brown. Fore wings pale brown, clouded with darker on dorsal and terminal areas; postmedial line white, oblique, sinuous; a white oblique line from the base near costa to dorsal extremity of the postmedial line; space enclosed by the white lines dark chocolate brown; subterminal line represented by dark dots outwardly edged with white; terminal line black, fringes dark brown, almost black. Hind wings dark fuscous. Under side pale brown freckled with darker; a dusky postmedial line on all the wings, and a black discoidal dot on the hind wings.

Expanse, 36 millim.

Collection number, 1458.

A male specimen from Kanshirei, April 27th, 1908.

Allied to *B. mandarina*, Zuch.

*Orthozona curvilineata*, sp. n.

♂. Head and thorax dark grey brown, abdomen paler; antennæ serrate-ciliate; palpi recurved, densely scaled, third joint half-length of second. Fore wings dark grey brown; antemedial dark brown; postmedial line dark brown, preceded by a slender, very wavy, brown line; postmedial and antemedial lines are parallel, broad, slightly

curved, the former from apex of the wing; reniform stigma pale, indistinct, a dusky dot at lower end; a black point in the cell, and some black lunules on the termen. Hind wings grey-brown, paler on basal two-thirds; antemedial line blackish, not extended to costa; postmedial line dark brown, outwardly edged with whitish, not extended to costa. Under side greyish, freckled with brown and clouded with darker on the outer area of fore wings; a fringe of long pale hairs from vein 12; black discoidal dot on hind wings and traces of a pale-edged dusky postmedial line on all the wings.

♀. Palpi porrect, third joint upturned, about one-third length of second, which is rather hairy above. Similar in colour and marking to the male, but with a slender, wavy, brown subbasal line on the fore wings.

Expanse, 30 millim. ♂; 40 millim. ♀.

Collection number, 1762.

One example of each sex from Rantaizan, the male taken May 10th, 1909, and the female May 9th, 1909. The palpi of the sexes differ in structure, but as regards this character the female agrees exactly with female *O. quadrilineata*, Moore, upon which the genus *Orthozona*, Hampson, was founded (Fauna Brit. Ind. Moths, vol. iii. p. 94).

*Orthozona bilineata*, sp. n.

♂. Fore wings pale greyish brown, antemedial and postmedial lines rusty brown, oblique, the postmedial broad commencing on the costa just before apex; reniform stigma pale ochreous, two brown dots in it; a black dot in cell; terminal line brown, interrupted at ends of the veins. Hind wings pale greyish brown with two rusty brown lines, apparently continuations of those on the fore wings; terminal line dark brown. Under side pale greyish, fore wings suffused with dusky on the disc, hind wings with a dusky discoidal dot and traces of two wavy transverse lines.

Expanse, 33 millim.

Collection number, 1761.

A male specimen from Rantaizan, May 11th, 1909.

Very similar to *O. curvilineata* but the lines of fore wings are oblique, the postmedial is from before apex instead of from the apex itself, and there are no hairs from vein 12 on under side. Antennæ and palpi as in *O. curvilineata* male.

*Anepa contigua*, sp. n.

♂. Head and thorax pale brown, crest on thorax rather darker; abdomen paler brown with minute black crests; antennæ fasciculated. Fore wings pale brown, freckled with darker; antemedial line dusky, indistinct, a white dot on it in the cell; postmedial line dusky, slightly sinuous, indented above dorsum; subterminal line indicated by a series of black dots parallel with termen. Hind wings whitish brown, suffused with fuscous; traces of a dusky discoidal dot. Under side pale brown, all the wings have a black discoidal dot and dusky postmedial line.

♀. Similar but without dark freckling on the fore wings, the postmedial line is more oblique and less sinuous.

Expanse, 32 millim. ♂ ; 35 millim ♀ .

Collections numbers, 1009 and 1876.

One example of each sex from Arizan (7500 ft.) taken in September, 1906.

Another female specimen captured at Arizan in August, 1908, appears to be referable to this species, but it is rather worn.

Closely allied to *A. oxydata*, Hampson.\*

*Heterogramma nigrisigna*, sp. n.

♀. Head and thorax pale grey brown, dusted with rather darker brown; abdomen paler. Fore wings pale grey brown, dusted with darker; antemedial line black, wavy; postmedial line black, wavy, excurved round cell, indented above dorsum; discoidal mark black, lunular: subterminal line pale ochreous brown, edged internally by an interrupted black line, followed on the costa by a quadrate black spot, terminating on dorsum near tornus. Hind wings pale brown, suffused with darker on tornal area; medial line blackish, curved; postmedial line pale ochreous, angled and internally black edged towards dorsum. Fringes of all the wings pale brown inclining to ochreous towards base, preceded by a blackish line. Under side pale brown, suffused with blackish on the fore wings, whitish powdered with brown on the hind wings; all the wings have a black discoidal mark and the transverse lines of upper side are traceable.

Expanse, 29 millim.

Collection number, 1019.

One female specimen from Kanshirei, April 17th, 1906.

Near *H. discosticta*, Hampson.

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## NOTES AND OBSERVATIONS.

THE Annual Verrall Supper at the Holborn Restaurant was no less a success this year than is usual. The record was reached in 1914 with a total of just over the century; but on January 19th, 1915, this was run very close by the "ninety-and-nine" who sat down to an ample supper, after much enjoyable chat upon the entomological exploits of the past year. All, or nearly all, the familiar faces were present; the main exceptions were the brothers Waterhouse, Mr. E. A. Newbery who had accepted, and the very few who have passed away in the interim, such as Rev. E. N. Bloomfield. These were, however, replaced by many new faces, prominent among which were Prof. J. W. Carr, of Nottingham, and Mr. Bruce Cumings, of the British Museum. Several of those present were in khaki, and our Allies were represented by at least one Japanese gentleman, as the chairman remarked in a most particularly happy speech, concluded by those present drinking in silence to the memory of Mr. Verrall.—C. M.

\* Journ. Bomb. Soc. xi. p. 707 (1898).

**NEW WORK ON BRITISH BUTTERFLIES.**—It is no doubt somewhat of an open secret that for some thirty years or more Mr. F. W. Frohawk has been collecting first-hand material for a complete history of the British Butterflies. In all some 1400 coloured drawings, delineating the various stages of each species from ova to imago, have been prepared in Mr. Frohawk's best style, together with copious explanatory manuscript. The whole was in order for the printer, and arrangements for publication were being made when the unfortunate outbreak of war rendered it impossible to proceed, and the publication of the complete work will, therefore, have to stand over until things have settled down again, when it is hoped that it may be produced in a style worthy of the labour that has been spent upon it. As, however, there is no guarantee when this opportunity may occur, it has been thought desirable that the whole of the vast information contained in the work should not be longer withheld from present-day entomologists. Arrangements have, therefore, been made with the proprietors of the 'Field' to publish it in an abridged form, and the first instalment appeared in the issue of that journal for December 26th last, and has since been continued weekly. In all some five hundred black-and-white reproductions of the more important of the original drawings, from photographs by Mr. A. W. Dennis, will appear, together with an abridged account of each species. The parts already published cover the introductory remarks and descriptions of the species of the Pieridæ, and are in all respects satisfactory. The present issue, although admittedly but an instalment of what it is hoped may follow later on, when it is possible to publish the complete work, bids fair to be a valuable addition to our knowledge of this interesting group of the British Lepidoptera, and as such we heartily commend it to our readers.—R. A.

**USE OF FORMALIN IN SETTING INSECTS.**—In reference to the notes on this process which have been published recently in the 'Entomologist' (xlvii. p. 325, and xlviii. p. 19), it may be of interest to offer some explanation of the action of formaldehyde on insect tissues. In the first place, formaldehyde is only known in solution, usually of about forty per cent. strength, and this is the "formalin" of commerce. "Formalin" liberates formaldehyde as vapour on evaporation, or more rapidly by boiling. Formaldehyde has the property of uniting chemically with gelatin and albumen; also with the animal tissues from which these are derived. It also, apparently, unites with chitin, the skeletal tissue of insects. The effect of this union of formaldehyde with any animal tissue or product is to render the latter insoluble in and resistant to the action of water; it is this property which no doubt explains the fixation of "set" insects, since after treatment with formaldehyde vapour these do not soften under the influence of moisture. With regard to the suggestion of Messrs. St. John and Kershaw, that this might be used also to prevent "grease," so far as I know formaldehyde does not combine with fats, but it is possible that it might prevent the decomposition which produces these undesirable greasy substances in the insects' bodies. In this connection I might again draw entomologists' attention to the use of formalin as a preventive of mould



(see 'Entomologist,' xxxiii. p. 90), but I should warn them not to subject "emeralds" to the treatment, as the tints are thereby spoiled; other colours seem to be quite resistant.—W. S. GILLES, F.I.C., F.C.S.; Bocking, Braintree.

FURTHER NOTE ON FORMALDEHYDE.—The interest—for I have received several communications on the subject—taken in my note in the 'Entomologist' of December last on the use of formaldehyde, prompts me to enclose a few further remarks which may be of interest to Mr. Kershaw and others. Solution of formic aldehyde or formaldehyde is synonymous with formalin, which is a trade term. It is usually sold in forty per cent. solutions, and should be kept in a well stoppered bottle, in a cool place, protected from light. Solutions of greater concentration than thirty-eight per cent. tend to crystallize out into the solid polymer, paraformic aldehyde. This is the usual form (mixed with a little paraffin wax) used for disinfecting houses, &c., by means of the "formalin lamp." In the concentrated form it is a powerful caustic, and should be handled with care. A one per cent. solution kills most micro-organisms, and a four per cent. solution is used as a hardening agent for microscopical purposes in pathology. It is incompatible with ammonia and fatty bases. From the above figures it is obvious that one can easily make a five or ten per cent. solution of formaldehyde in ether, in order to try Mr. Kershaw's excellent suggestion of hypodermically injecting insects. So far, I have not tried this method, because the vapour has hitherto given such good results with so little trouble, but I intend to at the first opportunity. One point occurs to me, *viz.* should the injection be done while the insect is still soft, or after the "initial set"? When soft, the needle would slip in easily, and there would be less risk of damage to the specimen, but the ethereal solution would probably permeate better when the insect was dry. Experience, however, will show.—WINSTON ST. A. ST. JOHN, M.R.C.S., L.R.C.P.; Derwent House, Derby.

LÆLIA CÆNOSA, &C., AT WICKEN.—With reference to Mr. G. B. Kershaw's notes on *Lælia cænosa* at Wicken ('Entomologist,' January, 1915, p. 20), it may be as well to state, for the benefit of the younger generation of lepidopterists, that the last record of the occurrence of the species in Britain may be found in pages 229 and 230 of the 'Entomologist' for 1879. In that year I took three specimens on the night of July 26th, and two more two or three nights later. Mr. Kershaw is quite right in saying that I exchanged those five specimens, still unset, for as many *Nascia ciliialis*; but it was not with the late Solomon Bailey, but with the late Albert Houghton. Since then that exchange has been the greatest entomological regret of my life! But at the time my then very short series of *cænosa* was complete, and as *ciliialis* was in those days considered rare, and a great desideratum with me, I let them go without any hesitation, never supposing there was even a possibility that *cænosa* might never again be recorded in Britain. The five specimens were all very fine males, bigger than any I possess even now. Houghton sold them to Mr. W. H. B. Fletcher, in whose collection they still remain. The

plantation referred to by Mr. Kershaw, in which *Hadena atriplicis* used to occur, was on the other side of Wicken from the Fen, and near to what was then known as Mr. Johnson's farm. The species has, however, been taken, I believe, in some numbers, at no great distance from Wicken, nearer Ely, I was told, much more recently; and in my series are seven very nice specimens, bred from that locality by the Rev. C. D. Ash, in 1899.—GEO. T. PORRITT; Huddersfield, January 8th, 1915.

PHALERA BUCEPHALA AT REST.—The simulation by this moth of a dead twig is quite well known: but some detail as to its capture, under somewhat peculiar circumstances, may perhaps be of interest, and for myself, I was enabled to take a number of specimens, merely through their incautious choice, as to suitable surroundings, of their resting place. My natural history rambles almost invariably take me through a short lane near here, where I usually obtain some good captures, and, as usual, I started my day's ramble with the intention of taking my periodical survey of this lane. I had reached a point some little way through here, when, what was my astonishment at seeing on the back of a green leaf of the corked barked elm tree a fine male specimen of *P. bucephala*, the dead twig resemblance being so remarkable that, had I not been looking for these moths, I should have passed it by, but my attention was not drawn to it by the dead twig resemblance, but by the exceptionally showy green background which rendered the insect doubly conspicuous to the collector; whereas, had the insect been settled with a suitable background, it would have escaped the keenest observer, as numbers of them do. Moreover, I have observed this occur quite frequently.—E. PHILLIPS; 64, Quantock Road, Windmill Hill, Bristol.

MELLINIA OCELLARIS, &c., IN CAMBRIDGESHIRE.—I thought it might be of interest to record that last autumn I took over two dozen specimens of *Mellinia* (*Xanthia*) *ocellaris* here (Shelford) among wych elm. The food-plant of this species is given as black poplar, I believe, but there is only one poplar tree in the immediate neighbourhood, and that is quite a quarter of a mile away; moreover, one of my specimens was taken resting on an elm trunk, with wings undeveloped, fresh from the pupæ, and all were in such good condition that they could not have flown more than a few yards at the most. Unfortunately, I was unable to obtain eggs from several females retained for the purpose, so cannot try the larvæ on either elm or poplar, and should be glad if someone could give me a few particulars concerning the early stages of this local moth, as on the last occasion (1907) of taking it I was unable to obtain ova, the cause being the same, infertility. A female sent this autumn to Mr. L. W. Newman, of Bexley, proved to be in the same condition; no doubt all those taken (at treacle) had only just emerged. Another likely food-plant of the larvæ here are the various kinds of willows, and more than once I have taken specimens among these trees. Although my series of the perfect insect is not extensive, I have several nice forms; one fine female being suffused all over the fore wings with "salmon" pink, and looked very unusual and beautiful on the sugar. Another

(a male) is exceptionally dark on both wings. I have not seen, however, any tendency to a central band, though one or two certainly approach it. With the exception of a good many *Lithophane* (*Xylina*) *semibrunnea*, I took very little else beside *M. ocellaris* last autumn, and even *M. gilvago* was very scarce (only seven turning up). In fact, I had very bad luck with all the Lepidoptera during 1914, and gave most of my attention to the Hymenoptera, in which family, owing to the continual fine weather, I was well rewarded.—HUGH PERCY JONES; "Westwood," Great Shelford, Cambridge, January 2nd, 1915.

ARASCHNIA LEVANA IN HEREFORDSHIRE.—I was pleased to note (Entom. xlvii. p. 325) that this interesting butterfly has turned up again at Symonds Yat and the Forest of Dean since my capture of May 28th, 1913. Apparently the species has established itself in this country, and that locality, seeing that it was taken in numbers this season. It would, however, be interesting to know if those caught by Mr. Hughes and Mr. Oliver are of the first brood, as the second brood are so different from the first, and appears about the end of July, which is the time I note the specimens referred to were taken. The specimen I took in May, 1913, is of the first brood, and was identified by Mr. H. Rowland-Brown, and exhibited by him before the Entomological Society of London, October 1st, 1913 (see 'Entomologist,' December, 1913, p. 336). Would Mr. Hughes and Mr. Oliver kindly say if the specimens taken by them were var. *prorsa* (2nd brood)?—T. BUTT EKINS; Loxbere House, Windsor Terrace, Penarth, December 12, 1914.

HADENA ATRIPLOCIS AT WICKEN.—Mr. Thurnall's short article in the December 'Entomologist' was specially interesting to me, inasmuch as I possess one—unhappily one only—*Hadena atriplocis*, taken by myself at Wicken, in 1879. In June of that year I went thither with my friend, the Rev. T. W. Daltry, and on our arrival, to our dismay we found the fen deep in water, so that collecting there was for the time impossible. We turned our attention to "sugaring" in a small plantation, called "Johnson's Spinney," which, I think, must be the same that Mr. Thurnall mentions; and there, amongst other things, mostly common, I was fortunate enough to obtain a fine male *atriplocis*, which still, after more than thirty years, adorns my collection. I only wish I knew where to get some more.—CHAS. F. THORNEWILL; 15, S. Margaret's Road, Oxford, December 8th, 1914.

UNUSUAL COCOONS OF HABROSYNE DERASA.—I have recently observed an occurrence which seems to me so unusual as to be worth recording. I have been breeding a number of larvæ of *Habrosyne derasa*, taken at large, and have found no less than three cases in which two larvæ have formed a cocoon in common. The cocoons are of normal form, but more extensively lined with silk than is common with the species, and in each case the two pupæ were lying side by side in the one cocoon, with no division of silk or ridge between them. The cocoons were formed in cocoanut fibre, and were, of



course, unusually large. I should be glad to know if this occurrence is as exceptional as it seems to me to be. I have never observed a similar instance in any of the Lepidoptera I have bred.—H. C. HAYWARD; The Croft, Repton, October 14th, 1914.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, October 7th, 1914.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Dr. Leslie C. Coleman, D.Sc., Dept. of Agriculture, Bangalore, Mysore, India, and the Rev. Frederic S. F. Jannings, Warmsworth Rectory, Doncaster, were elected Fellows of the Society.—Mr. O. E. Janson exhibited an abnormal specimen of *Melitæa aurinia*, taken in Kent, in which six of the nervures were almost symmetrically deficient on either side.—Mr. G. T. Porritt, a series of *Chloropera venosa*, Steph., taken by Professor Carr and Mr. Mottram on the river Trent, near Nottingham; also a series of *C. grammatica*, Poda, for comparison.—The Rev. F. D. Morice, a specimen of *Crabo (Lindeinus) albilabris*, F., female, with abnormal ocelli; also a photograph, from nature, of eggs *in situ*, laid in a rose-stem in a double row by Vallisnieri's "Mosca dei Rosai," *Arge pagana*, exactly as in the author's original figure.—The Rev. G. Wheeler, a gynandromorphous specimen of *Plebeius argyrognomon* taken by him in the Val Maggia on July 13th this year, exactly halved, the right wings being female, the left male. Also an extreme example of ab. *persica* of *Polyommatus icarus* taken on the marshes at Altmatt on July 11th, and a male of *Pararge mæra* with symmetrical deeply concave costa of both fore wings, taken on the Via Mala on July 17th; also a well-marked series of *Pieris manni* from Vernayaz, taken on July 5th this year.—Mr. Prideaux, a very perfect example of *Rumicia phlæas*, ab. *schmidtii*, of a pale yellow colour; also a male *Polyommatus icarus*, ab. *obsoleta*, and some very blue females of the latter species, all taken in the neighbourhood of Brasted, N. Kent.—Mr. Donisthorpe, specimens of *Platyphora lubbocki*, Verrall, and *Ænigmatias blattoides*, Meinert, which he had reared in a nest of *Formica picea*, Nyl., taken in the New Forest in July last. He pointed out that he believed he had proved that these two flies were the male and female of same species.—Mr. L. W. Newman (1) A curious gynandromorphic *Polyommatus icarus*, the right fore wing being female and the remaining three wings male except for one orange lunule on each of the hind wings. (2) A curious Zygænid of doubtful species, being small and having four spots only. (3) A short series of *L. ilicifolia*, bred from the wild female taken May, 1913, at Cannock Chase by Mr. Oliver. (4) A pair of beautiful *Neuria saponariæ* from the Cork coast, the ground-colour being a rich pink instead of the usual yellowish colour.—The following papers were read: "Contributions to the Life-History of *Polyommatus eros*," by T. A. Chapman, M.D., F.Z.S., F.E.S.; "Parthenogenesis in Worker-bees at the Cape," by R. W.



Jack, F.E.S.; "Description of New Species of *Catantacta*," by W. F. H. Rosenberg, F.E.S.; "Revision of the Species of the Genus *Odynerus* (Hymenoptera) occurring in the Ethiopian Region," by G. Meade-Waldo, M.A., F.E.S.; "Some Remarks on the Coccid Genus *Leucaspis*, with Descriptions of two New Species," by E. Ernest Green, F.E.S.

Wednesday, October 21st.—The Hon. N. C. Rothschild, M.A., F.L.S., F.Z.S., Vice-President, in the chair.—Messrs. L. D. Cleave, Dept. of Science and Agriculture, Georgetown, British Guiana, and J. R. Menon, B.A., Trichur, Cochin State, South India, were elected Fellows of the Society.—The death was announced of Mr. William Warren, M.A., F.E.S.—Dr. T. A. Chapman exhibited three abnormal specimens of Anthrocerids, and read notes.—Mr. L. W. Newman, a long and varied series of *Dianthæcia barrettii*, bred from wild larvæ collected in Co. Cork, and dug pupæ from S. Devon; also a series of *Boarmia repandata*, all bred from wild collected larvæ from a very small radius in the Wye Valley, the range of variation being startling.—Mr. A. E. Tonge, a specimen of the hybrid *A. populi* ♂ × *S. ocellatus* ♀, bred *ab ovo*, which emerged September 11th, 1914. A pairing had been obtained by Mr. T. H. L. Grosvenor, of Redhill, in May, 1913. About forty ova were laid, but only one hatched, the resulting larva pupating in August, 1913; also a specimen of *R. phlæas*, taken on Deal sandhills in September, 1914, without the red marginal band on the hind wings.—Mr. G. Meade-Waldo, a styliposed specimen of the Sand-wasp, *Ammophila tydei*, Guill., from South Africa. There were no less than seven Stylops parasitic on it.—Mr. E. B. Ashby, some South European butterflies, chiefly from the South of France.—Mr. Rippon, a variety of *P. monacha*, which, as far as he had been able to ascertain, had not been previously recorded. The variation consists in the body being banded with black and yellow; also, five specimens of *Triphæna fimbria*, bred from Pamber Forest larvæ.—Mr. A. H. Jones, a number of moths from Sarepta, and read notes.—Dr. E. A. Cockayne exhibited: (a) Thirty-eight gynandromorphous *Agriades coridon* from Royston; (b) Two females of *A. coridon* from Royston showing streaks of blue. Neither showed any signs of androconia. (c) One gynandromorphous *Polyommatus icarus* (Co. Clare, 1914), predominantly female *ab. cærulea*, but with streaks of male colour on the right fore wing and both hind wings. These showed androconia as regularly arranged and numerous as in areas of the same size and situation in a normal male.—The following paper was read: "On Hawaiian Ophioninæ (Hymenoptera, Fam. Ichneumonidæ)," by R. C. L. Perkins, M.A., D.Sc., F.E.S.—Rev. GEORGE WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 12th, 1914.—Mr. A. E. Gibbs, F.L.S., Vice-President, in the chair.—Mr. Sich reported having seen a *Pyrameis atalanta* in Holborn on that day, November 12th.—Mr. H. Moore exhibited a small colony of the ant *Camponotus abdominalis*, found in a banana from the W. Indies.—Mr. Step, abnormal catkins of hazel from Mickleham, probably due to the attack of the gall-mite *Eriophyes*

*coryli*.—Mr. Hall, a gynandromorphous specimen of *Agriades coridon*, essentially a female but with patches of blue scales and androconia on the right fore wing.

November 26th.—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—Mr. R. Adkin, long series of *Agriades thetis*, including males of aberrant colour, often asserted to be hybrids with *A. coridon*; females showing blue coloration of the male; and many under side varieties.—Mr. H. Worsley-Wood, a bred series of *Callimorpha quadripunctaria* (*hera*) and its aberration *lutescens*.—Rev. G. Wheeler, series of *Plebeius argyrognomon* var. *armorteanus* from Brittany with emphasised markings, series of *Hesperia malvæ* var. *taras* from the Rhone Valley, a gynandromorph of *P. argyrognomon*, right female, left male, &c.—Mr. Prideaux, a gynandromorph of *Trichiura crategi*, *Agriades coridon*, with silver-tipped peacock eyes on hind wings upper side, with albinistic and melanistic specimens of several species.—Mr. Talbot, for Mr. J. J. Joicey, rare exotic Lepidoptera, including *Ornithoptera alexandriæ* and *O. rothschildi*, with several rare and new species of *Papilio*, very fine species of *Hepialidæ* from Australia, including *Charagia ramsayi* and a *Tinæid* which attacks the larvæ, and some very fine *Cossidæ*, also from Australia.—Mr. A. E. Gibbs, new world *Papilionidæ*, including *P. ornythion*, *P. montezuma*, *P. gundlachianus*, *P. sesostris*, *P. lycimenes*, *P. torquatus*, *P. homerus*, *P. glaucus*, &c., with their various local races, and gave notes on each species.—The Rev. A. S. Stiff, a series of *Epinephele tithonus* from Tavistock, showing much colour variation and considerable aberration in the spotting, and a very varied series of *Ematurga atomaria*, including very fine yellow forms and a female with male coloration.—Mr. Ashdown, a series of *Aphantopus hyperantus* with aberrant and asymmetrical spotting on the under side, including ab. *cæca*.—Mr. Turner, an aberration of *Argynnis niobe* with the upper side black, spotting coalesced into an irregular band and the under side silver basal spots coalesced into three large blotches.—Mr. Newman, a large number of Irish Lepidoptera, including *Pieris napi*, *P. rapæ*, *Polyommatus icarus*, *Dryas paphia*, *Melitæa aurinia*, *H. semele*, *Neurica reticulata*, &c., all more or less of local forms, bred *Dianthus luteus* var. *barrettii*, *Pachnobia hyperborea*, and *Callimorpha dominula* ab. *rossica*, a long series of aberrations of *Agriades coridon*, two *Anthrocera filipendulæ* ab. *chrysanthemi*, eight bred *Gastropacha ilicifolia* from Cannock Chase, and many other striking forms and local species.—Mr. A. H. Jones, aberrations of *Melanargia galathea*, ab. *pallida* of *A. coridon*, ab. *pallida* of *Cenonympha pamphilus*, and melanic examples of *Amphidasys betularia*, *T. variata*, and *Cidaria immanata* from Eltham.—Mr. Schmassmann, a number of *Ornithoptera* and *Morpho*, including *O. lydius*, *O. cræsus*, *O. bornemannii*, *O. poseidon* and its races, *O. paradisea*, *Morpho hecuba*, *M. justilie*, *M. amphybion*, *M. cæcica*, *M. rhetenor*, and *M. aureola*.—Mr. West, the reference collection of the Society, including the numerous additions made by the Dawson donation.—Mr. Pickett, very long series of *Angerona prunaria*, the results of seventeen years' breeding and experiment, including many examples bred under varied colour conditions; he also showed long series of *Agriades coridon*, with many

aberrations and gynandromorphs.—Dr. T. D. Morice, a collection of British Chrysididæ and a collection of the more conspicuous species of Palearctic Chrysididæ.—Mr. Curwen, series of the European *Parnassius*, *P. apollo*, *P. delius*, *P. mnemosyne* and *Dorilis apollonius*, and series of *Lycæna*, *L. arcas*, *L. arion*, *L. alcon*, *L. euphemus* and *L. iolus*, with several aberrations of *Apatura ilia*.—Mr. Mera, a long varied series of *Psilura monacha*, including ab. *erimita*.—Mr. Tonge, a male *A. thetis*, 22 mm. in expanse, *Polyommatus icarus* blue females and ab. *icarinus*, ab. *striata*, &c., with pink and melanic *Bryophila perla* from Deal.—Mr. H. B. Williams, aberrations of *Euchloë cardamines*, *Cænonympha pamphilus* ab. *pallida*, *Aricia medon*, ab. *albiannulata*, *Rumicia phleas*, ab. *radiata*, ab. *obsoleta*, ab. *subobsoleta*, and ab. *anticostrata*, *Amorpha populi*, gynandromorphs, *Agriades coridon*, ab. *semisyngrapha*, ab. *obsoleta*, ab. *pallida*, and ab. *inæqualis*.—Rev. J. E. Tarbat, a *Pieris rapæ* measuring only 38 mm. in expanse.—Mr. Brooks, an *Abraxas grossulariata* with pale orange ground colour and no bright orange on fore wings.—Mr. Platt Barrett, the three *Parnassiids* of Switzerland, and noted the small amount of variation he had seen in the species this year.—Mr. Stallman, a varied series of *Xanthorhœ fluctuata*, some very dark, and including ab. *costovata*, and aberrations of *R. phleas*, *N. augur*, *T. comes*, and of *M. circellaris* red and slaty forms, light orange ground and streaky forms.—Mr. Edwards, many species of *Papilio* from the Indian and Austro-Malayan Region.—Mr. B. S. Williams, a melanic *Biston hirtaria*, the rare form ab. *fumaria*, from Finchley, bred.—Mr. Sheldon, the *Lepidoptera* taken by him in S. E. Russia during May and June, including local forms of western species and several more eastern species:—*E. cardamines* var. *volgensis*, *C. rubi* var. *schanyl*, *P. amanda* var. *lydia*, *M. aurinia* var. *sareptana*, *M. cinxia* var. *obscurior*, *M. phœbe* var. *ætheria*, *M. trivia* var. *fascelis*, *A. niobe* var. *kuhlmanni*, *M. iapygia* var. *suvarovius*, *S. hermione* var. *tetrica*, &c., and *C. erate*, *P. eroides*, *S. anthe*, *H. cribrillum*, *P. clymene*, *N. lucilla*, &c.—Mr. Pearson, species and aberrant examples of alpine butterflies taken this year, including *Brenthis pales* ab. *napæa*, *E. medusa* ab. *hippomédusa*, *B. thore*, pale *E. lappona*, *E. ceto* ab. *obscura*, &c., from Engadine and Tyrol.—Mr. T. W. Hall, his collection of *P. icarus*, *A. coridon* and *A. thetis*, including many fine aberrations and several gynandromorphs.—Dr. Cockayne, the series of *A. coridon* described in his paper in the Ent. Rec. on gynandromorphs, and also two similar forms of *P. icarus*.—Mr. H. E. Page, series of *Plebeius argus* from many alpine localities, and also a series of var. *casaiacus* from Pajares, &c. in Spain.—HY. J. TURNER, *Hon. Rep. Sec.*

LONDON NATURAL HISTORY SOCIETY.—Arrangements have been made by the *Lepidoptera* Committee of the above Society for a member of the Committee to attend at Salisbury House at 6.30 p.m. on meeting nights (first and third Tuesdays in each month, except July and August) for the purpose of giving advice and assistance to young entomologists, whether members of the Society or not. A cordial welcome will be extended to any who care to avail themselves of this arrangement.







W. J. Lucas del.

SYMPETRUM FLAVEOLUM.

NYMPH (· 4).

# THE ENTOMOLOGIST

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[No. 622

ODONATA, &c., TAKEN BY DR. T. A. CHAPMAN IN  
JULY AND IN MAY, 1914.

By W. J. LUCAS, B.A., F.E.S.

(PLATE III.)

WITH his usual kindness Dr. Chapman secured for me in July last a few Pyrenean insects belonging to the orders Plecoptera, Ephemeroptera, Odonata, Neuroptera, and Trichoptera. We must still, I fear, describe these orders as "neglected," but if other lepidopterists would in the same way spare a little time occasionally for entomology in general, the objectionable epithet would soon tend to become inapplicable. On the present occasion I have particularly to thank Dr. Chapman for enabling me to obtain a figure and description of the nymph of that very interesting dragonfly, *Sympetrum flaveolum*, which, like the Peacock Butterfly, is in Britain on the verge of its permanent habitation, apparently indeed just outside it. *S. flaveolum* occurs here as a migrant, not in most seasons as does *V. cardui*, but only very occasionally, though it is quite possible that after a large migration British-born examples may occur for a season or two, as may also be the case with *S. fonscolombii*. I am not aware that either the description or the figure of these nymphs has so far appeared; I have therefore prepared both for *S. flaveolum* from the material which Dr. Chapman has supplied.

During his visit to the Pyrenees Dr. Chapman's headquarters were: Gavarnie in the Central Pyrenees (July 12th-31st) at an altitude of 4430 ft., and Gabas in the Eastern Pyrenees (July 8th-11th) at an altitude of 3690 ft. In each case collecting was done chiefly up-hill, as high as 8000 ft. from Gavarnie and 6000 ft. from Gabas. The collection, though not an extensive one, was widely scattered over the Insecta, and I have to thank Mr. K. J. Morton and Rev. A. E. Eaton for assisting me with the identification of some of the species.

1. **Plecoptera.**

*Perla cephalotes*. Female, Gabas.

*Arcynopteryx dovreensis*. Two males, one female, Gabas.

*Chloroperla grammatica*. Gabas and Gavarnie.

*Nemoura variegata*. Gabas.

*Nemoura* (sp.?). One male, two females, Gabas, belonging to the *marginata* group and somewhere near *obtusa*, but the single male is in poor condition.

2. **Ephemeroptera.**

One male sub-imago, apparently of the genus *Rhithrogena*, without any dark longitudinal, submedian, femoral streaks. The Rev. A. E. Eaton cannot say definitely whether or not it is *Rh. semicolorata*. Gavarnie.

3. **Odonata (= Paraneuroptera).**

*Sympetrum flaveolum*. One male of mature colouring, four males teneral, one female teneral, one nymph-skin with a female recently emerged from it, another nymph-skin of the same species but without the imago. All from Gavarnie. Dr. Chapman says that the ponds producing *S. flaveolum* were above 4430 ft. in altitude (say 5000 ft.): a "hatful" (size not mentioned) of nymphs, nymph-skins, and teneral imagines might have been obtained there. Mature imagines had usually left the neighbourhood and what efforts he made to catch them were very unsuccessful.

*Cordulegaster annulatus*. One female, Gabas; the left hind wing deformed near the tip.

*Calopteryx virgo*. One male, Gabas; wings with teneral colouring.

*Lestes dryas*. Twelve males, Gavarnie.

*Lestes sponsa*. One male, Gavarnie.

*Pyrrosoma nymphula*. One male, Gabas; two females, Gavarnie.

4. **Neuroptera.**

*Ascalaphus coccajus*. One male, four females, Gavarnie; nice specimens from several localities at about 4800 ft. elevation.

*Sialis fuliginosa*. One, Gabas.

*Panorpa meridionalis*. One male, one female, Gabas; three females, Gavarnie; all strongly marked, and with very black spots.

5. **Trichoptera.**

*Asynarchus cœnosus*. Male, Gavarnie.

*Drusus discolor*. Male, Gabas; male, Gavarnie.

*Drusus rectus*. Three males, Gavarnie.

*Apatania meridiana*. Male, Gavarnie.

*Sericostoma pyrenaicum*. Male, Gabas.

*Micrasema morosum*. Male, Gavarnie.

*Hydropsyche pellucidula*. Female, Gabas.

*Wormaldia subnigra*. Female, Gabas.

*Plectrocnemia scruposa*. Female, Gavarnie.

*Rhyacophila occidentalis*. Female, Gavarnie.

*Rhyacophila tristis*. Female, Gavarnie.

DESCRIPTION OF NYMPH OF *S. flaveolum*. (Plate III.)

General colour sepia, but varying in depth of tint. *Length*, including anal appendages, about 16.5 mm.; greatest *breadth* about 5.5 mm. *Head*, transversely about 4.25 mm.; longitudinally about 3 mm.; in shape pentangular, somewhat rectangular behind; surface fairly smooth, except for a few hairs of considerable length on the occiput; top of head rather flat; colour of head fairly uniform, though in places there are some slightly darker markings. *Eyes*, rather large, situated at the forward corners of the head, nearly hemispherical in shape. *Antennæ* of seven segments; length about 2 mm.; the basal segment globular, the next cylindrical, the rest hair-like; the fourth segment is short compared with the rest of the hair-like ones. *Labium* (mask) decidedly and deeply spoon-shaped, covering the mouth, somewhat rapidly narrowed towards the hinge, which is situated in front of the insertion of the mid-legs; mid-lobe, with apical angle considerably greater than a right angle, and margin almost entire; moveable lobes (palpi) sub-triangular, outer and inner margins convex and nearly entire, distal margin nearly straight and slightly toothed; moveable joint at junction of outer and distal margins rather long and slender (to all appearance of little use for purposes of holding); mental setæ about nine in each comb, lateral about eleven in each, all pale and slender, inserted in a rufous socket. *Prothorax* narrow, collar-like. *Mesothoracic spiracles* large and conspicuous. *Mesothorax* and *metathorax* smooth, mottled with darker brown markings. *Legs* nearly concolorous, neither very rough nor very hairy, though tibiæ have a fringe of hairs; length of fore-legs about 9 mm., of mid-legs about 9.5 mm., of hind legs about 14 mm. *Abdomen* practically without hairs, slightly mottled and bearing a few dark dots dorsally, smooth and unicolorous ventrally; a small blunt mid-dorsal spine on the hind margin of each of segments six, seven and eight, and small lateral sharp ones on the hind margin of segments eight and nine; the ninth segment truncated behind, the tenth small. *Anal appendages* small, pointed, surrounded by hairs, dorsal appendage of moderate length, triangular; laterals shorter and more slender; lower ones slender and longer than the other three.

*Material*.—A nymph-skin with the recently emerged female, and another nymph-skin presumably of the same species (and agreeing on examination); from Gavarnie, Hautes Pyrenees, July 12th–31st, 1914; brought home and given to the author by Dr. T. A. Chapman.

When compared with the nymph of *S. striolatum* (*vide* Entom. xlvii. pl. ii. 1914) the great difference in length of the lateral abdominal spines will be at once noticed, and these provide a sufficient means of discriminating the species.

In May Dr. Chapman paid a visit to Pallanza in Italy, whence he brought:—

**Odonata.**

*Libellula quadrimaculata*. One male.

*Orthetrum cancellatum*. One female.

**Trichoptera.**

*Tinodes wæneri*. A series.

*Polycentropus flavomaculatus*. One.



**Neuroptera.**

*Megalomus hirtus*. One specimen. As it is a female, it does not give much assistance towards identification in its anal structures, but it is more like the northern *hirtus* than the southern *tortricoides*.

Kingston-on-Thames: February, 1915.

## THE BUTTERFLIES OF THE BUCKS. CHILTERNs.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 30.)

8. *Agriades thetis*, v. Rott. (= *bellargus*, v. Rott.). I had always supposed this species to be extinct in the Chilterns, or, at all events, in that part of the range then known to me, until in June, 1900, I came across a small colony on a piece of ground less than an eighth of an acre in extent. Being abroad that year I did not revisit the spot at the normal time of the second emergence, but I have done so both in spring and in autumn many times since; though never again have I been fortunate enough to repeat the experience (*cp.* 'Entomologist's Record,' vol. xii. p. 349).

Writing to me on December 30th, 1900, Mr. Peachell, who was then living at High Wycombe, says: "*Re P. bellargus*, it is curious that we have never found the species in this neighbourhood till the present year." Mr. Spiller informs me that Mr. Hatton, of Postcombe, took a series in a chalk-pit somewhere between this point and mid-Bucks., but that he too had since visited the locality without result. Just over the county border, in Oxfordshire, the Rev. J. W. B. Bell discovered the species in September, 1899, at Pyrton, near Watlington. But Mr. Spiller, who recently searched the locality given ('Entomologist's Record,' vol. xiv. p. 51), did not observe it; and probably the attempt to extend westward had failed there also. But at no very distant date it must have pervaded the range, for the Rev. H. H. Crewe records it from Drayton-Beauchamp; the Rev. Joseph Greene from Halton. In 1900, also, it seems to have reached thus far, as Mr. N. C. Rothschild writes ('Entomologist,' vol. xxxiii. p. 352) that "it occurs about two miles from Tring, just beyond the Hertfordshire border, though it is always rare." Later search of these localities appears to have been fruitless. It remains to hope that under favourable conditions *A. thetis* (if that be the true specific name, which I doubt) may once more be re-established on a terrain apparently so well adapted to its natural history.

Earliest seen, June 9th, 1900; a week later the females

preponderated, none of them approaching the form which we have generally accepted as var. *ceronus*, Esp.

9. *A. corydon*, Poda. The usual form of the Chilterns is large, brilliant in colour, with deep black marginal borders on the fore wings, though the narrow-bordered form is by no means uncommon. In the males there are occasionally traces of orange above the ocellations nearest to the anal angle of the hind wings, as in ab. *suaris*, Schultz. The females display a wide range of variation, from deep brown, without a trace of blue scaling, to the extreme andromorphous ab. *tithonus*, Meig. (= *syngrapha*, Kef.), the one and only example of which, taken by me in Buckinghamshire on September 9th, 1913, is recorded in the 'Entomologist' (vol. xlv. p. 290). Ab. *senisyngrapha*, Tutt, occurs very rarely. On September 12th, 1907, when collecting with Miss Fountaine, one or two were taken among many intermediates; this being a late season. The form ab. *albipuncta*, Tutt, is also included in my series. Aberrations of the under side in the female with confluent and asymmetrical spots are not infrequent. I have also several ab. *parisiensis*, Gerh., from the same spot.

Locally abundant, it is generally to be found on all the north and westward facing slopes, with a few stragglers coming over to the south, but never beyond the chalk limit.

Earliest seen, August 3rd, 1899; latest, September 13th, 1908.

10. *P. icarus*, v. Rott. In warm summers there are usually three distinct emergences, the females presenting many charming forms, and, generally speaking, in the direction of decided male coloration. Ab. *icarinus*, Scriba, usually a few each year. Following the diagnosis of the species made by Tutt in his 'British Butterflies,' I find the following female forms well represented:—Ab. *cærulescens*, Wheeler, ab. *semiclara*, Tutt, ab. *thestyliis*, Kirby. Besides which, I have ab. *cærulea-angulata*, Tutt, and one interesting female taken in June, 1907; all the wings pale lavender-blue. On the fore wings the orange spots of the antemarginal band are obsolete, and the ground colour beneath pale whitish; in the same way the orange spots of the hind wings are obsolescent. The "all brown" female is decidedly rare. Mr. Warren reports an example of ab. *arcua*, Wheeler, August 9th, 1911; and I occasionally meet with the ab. *crassipuncta*, Courv.

Earliest seen, *gen. vern.*, May 19th, 1900. I have an unusually early date in my diary, April 23rd, 1901, but I am not sure from entry whether it relates to Bucks., or Middlesex. *Gen. æst.*, July 30th, 1899; *gen. auctumn.*, September 6th, 1902; latest seen, October 9th, 1913.

11. *P. medon*, Hufn. (= *agestis*, Schiff.). Always a common butterfly on the chalk downs; in favourable years first and

second emergence alike are plentiful. Mr. Wheeler reports that where he has collected on the Continent the species does not occur in quantities flying together ('British Butterflies,' Tutt, vol. iv. p. 228, note). In the Chilterns my experience is entirely to the contrary. Mr. B. C. S. Warren speaks of it in the second brood (*in litt.*) as, "apart from the common 'Whites,' quite the commonest butterfly I ever saw there; a very small form, but very well marked. Even in tiny males the orange lunules on the upper side of both wings were always complete." He, too, presents a lucid account of the local variation of the species in the second emergence; the costal spot being absent in all cases ('British Butterflies,' Tutt, *loc. cit.*, p. 233). In the eighteen years that I have collected in this neighbourhood I have observed no decrease in the relative abundance of the two emergences, except in very wet or otherwise uncongenial seasons when everything else has been equally affected.

Earliest seen, *gen. vern.*, May 22nd, 1914; *gen. aest.*, August 3rd, 1899; latest, September 27th, 1913, a female ovipositing.

[*Plebeius argus*, L. (= *ægon*, Schiff.). I am quite at a loss to account for the absence of *argus* in the heath and gravel districts which border on the chalk towards the south of the Chiltern range. My correspondents have been no more successful than I in locating the species hereabouts. On the hills themselves also I have searched carefully each season, but so far I have been unrewarded. But it is a butterfly very easily overlooked among other "Blues," even by experienced collectors.]

12. *Celastrina argiolus*, L. I did not consider the Holly Blue at all a common insect in the Chilterns until the spring of 1912, when I found it in numbers flying over the dogwood bushes in a deep chalk lane. Since then I have observed it in May and August plentiful at the same spot, and in many other localities on the south slopes towards Great Missenden where there is holly. Mr. Peachell (*in litt.*) reports it at High Wycombe, "usually very fairly common, especially in the spring brood."

Earliest seen, *gen. vern.*, April 20th, 1912; latest, May 29th, 1912; *gen. aest.*, earliest, August 9th, 1913. On September 27th of that year I saw a male, of what I believe to be a third emergence, flying in the road at Aston Clinton.

13. *Callophrys rubi*, L. One of the commonest Chiltern butterflies in favourable seasons. Affects the fresh green foliage of the hawthorn and young oak, the males often flying high and fast. *Ab. immaculata*, Fuchs, is by no means rare. No trace of a second emergence has ever been detected by me. From High Wycombe (Peachell) to Drayton-Beauchamp (Rothschild).

Earliest seen, April 20th, 1912; latest, June 29th, 1909.

14. *Zephyrus quercus*, L. I myself have never come across this Hairstreak in the district. It is reported by Mr. G. C.



Barrett in the Buckinghamshire list ('Victoria History') at Wendover on the east; and Mr. Peachell used to take it in the neighbourhood of High Wycombe on the west. In the southern parts of the county it seems to be fairly common, *e.g.* at Chalfont St. Peter's, abundant; Rev. J. Seymour St. John (Entom. vol. xxii. p. 165), Burnham Beeches and Beaconsfield. Mr. L. E. Dunster writes (*in litt.*) that he has never taken the species in Bucks., but that a friend of his captured examples near High Wycombe on August 5th, 1913. Oak woods are infrequent on the Chilterns themselves, hence probably the scarcity.

(To be continued.)

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## NOTES ON BUTTERFLIES IN MAJORCA IN JANUARY, FEBRUARY, AND MARCH, 1914.

BY H. O. HOLFORD, F.E.S.

HAVING spent many winters in the Island of Majorca on account of its excellent winter climate, its beautiful scenery, and friendliness of its inhabitants, my wife and I arrived there at the end of December, 1913. I have always done a certain amount of butterfly hunting whilst there, and I thought that the following notes on insects taken or observed might be of interest:—

Our headquarters were at Cas Catala Hotel, about four miles from Palma, along the coast, a most comfortable hotel situated right on the sea, and it was within a few miles from here that my collecting was done, until we went to the extreme east of the island.

The country for the last three years had suffered very much from drought, and all the vegetation, except in the highly cultivated parts, was visibly affected; wild flowers and almond blossom was quite six weeks late; insects were also later than usual. Running north from the hotel is a very long sheltered rocky ravine, with plenty of scrub and fairly well-wooded in parts; this has always been one of my best hunting grounds, but this year there was nothing much about, and it was much the same in other places, the insects were there but few in number. The weather was windy and much colder than I have experienced in previous years, but certainly very much better than in any of the usual European winter resorts. The whole of the ground here is rocky, except in the cultivated patches, partly covered with low scrub pines and ilex or evergreen oak; other parts mostly barren, steep, rocky ground; the lower parts and valleys were well cultivated with almonds, olives, figs and the locust bean tree. I found there were invariably more insects on the steep barren rocky south slopes than in more inviting-looking places, where there was plenty of vegetation



such as *Cistus* and tall heaths; this was, no doubt, due to the great heat on the bare rocks which attracted them. It was not an easy hunting ground, and string-soled canvas boots called "alpargatas" were almost a necessity.

January 10th.—*Macroglossa stellatarum*. In previous years these were swarming. I have taken several, they were not in very good condition; hybernated specimens. *Pyrameis atalanta* (one). 12th.—*Cyaniris argiolus* (one), *Pyrameis cardui* (one). 18th.—*P. atalanta* (one).

February 1st.—*P. atalanta* (one), *C. argiolus* (one). 2nd.—*P. atalanta* (one), *Lycæna telicanus* (two). 3rd.—*P. atalanta* (one), *L. telicanus* (two), *C. argiolus* fairly numerous. 5th.—*Pararge egeria* (one), *P. atalanta* (one), a few *C. argiolus* about. 6th.—*P. egeria* (one), *L. telicanus* (one). 7th.—*L. telicanus* (one), *P. atalanta* (one). 8th.—*Pararge megæra* (two), *L. telicanus* (three). 9th.—*C. argiolus* (one), fresh hatched. 11th.—*C. argiolus* (two). On February 12th, 1913, I took a female *L. batiscus* freshly emerged; this year I did not see this species. 14th.—*L. telicanus* (three), *P. atalanta* (one), *C. argiolus* (three), *Colias edusa* (one). 15th.—*P. daphidice* taken (two), a few others seen, *C. argiolus* (one seen). 16th.—*Callophrys rubi* (one), *P. daphidice* (one, male), *L. telicanus* (one), *Gonepteryx cleopatra* (one male). 18th.—*P. daphidice* (one). 19th.—*M. stellatarum* (one), *C. argiolus* (one, female), *P. egeria* (one), *P. megæra* (one), *P. atalanta* (one), *C. argiolus* numerous. 21st.—*P. egeria* (one). 26th, and 28th.—*Cænonympha pamphilus*, one each day.

March 1st.—*C. edusa* (one), *P. daphidice* (two), *P. megæra* (one), *G. rhamni* (one), *C. rubi* (one), *C. argiolus* numerous. 2nd.—*Pieris brassicæ* (one male fresh from chrysalis), *P. rapæ* (two, just emerged), *P. daphidice* (one), *P. egeria* (two), *P. megæra* (one). 3rd.—*P. rapæ* (one, freshly emerged), *P. egeria* (one), *L. telicanus* (one, worn). 4th.—*C. rubi* (one), *C. pamphilus* (one), *P. megæra* (one), *C. argiolus* and *P. daphidice* numerous. 5th.—*G. cleopatra* (one, male), *C. rubi* (two), *P. cardui* (one), *L. telicanus* (one). 6th.—*P. machaon* (one), *G. rhamni* (one, female), *P. daphidice* (one), *P. rapæ* (four, three males, one female), *P. megæra* (one female). 7th.—*G. cleopatra* (one, male), *G. rhamni* (one, female), *P. daphidice* (one, female), *C. rubi* (one), *L. telicanus* (one). 8th.—*G. cleopatra* (one, male). 9th.—*C. pamphilus* (one). 10th.—*P. daphidice* (one), *P. egeria* (one), *P. rapæ* numerous.

On March 11th we left for the Port of Alcudia, situated in a magnificent sandy bay in the east of the island, where the scenery differed very much from Cas Catala. There are extensive flat lands, where formally rice was grown, with numerous dykes and large lagoons of brackish water, bounded on the north and south by hilly land, with plenty of wild vegetation. The weather was very hot and at times very windy.

March 14th.—*G. rhamni* (one, female), *C. rubi* (two), several *M. stellatarum* about, *P. rapæ* (one). 16th.—*C. rubi* were swarming in a ravine; I took several, and caught a great number for inspection, hoping to find *C. avis* amongst them, but my search was unsuccessful. 26th.—*C. rubi* (three), *G. cleopatra* (one, male), *C. phleas* (one), *P. megæra* (one, female), *P. machaon* (one). 27th.—*C. rubi* (three). 28th.—*C. rubi* (one); a few *P. daplidice* seen. 29th.—*L. icarus* (one, male), *G. cleopatra* (two, males), *G. rhamni* (one, female), *C. rubi* (two). 30th.—*L. icarus* (two, one male and one female). 31st.—*C. pamphilus* (one), *C. rubi* (one), *G. rhamni* (one, female), *P. megæra* (one, female), *G. cleopatra* (one, male).

On April 11th we left for Palma en route for Barcelona. Whilst in Barcelona I visited the museum, which is anything but up to date; the collection of insects was in glass cases exposed to the light, and they were mostly faded out of all recognition.

Elstead Lodge, Godalming.

#### GYNANDROMORPHOUS SPECIMEN OF *ABRAXAS GROSSULARIATA*.



THE above figure represents an exceedingly interesting specimen of *Abraxas grossulariata* which was reared last season by Mr. R. Tait, junr., of Ashton-on-Mersey. He writes:—"It came from a batch of Huddersfield larvæ, the progeny of light pairings, and was practically the only specimen out of some five hundred of the same batch worth keeping."

We incline to the opinion expressed by Mr. Tait that the insect is gynandromorphous. Judging from the photograph, we should say that on the left side the insect is male and on the right side, female. So far the genitalia have not been critically examined. If this were done, gynandromorphism would probably be found complete.

## NEW SPECIES OF HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

## GEOMETRIDÆ.

*Euchlœna* (?) *lilacina*, sp. n.

♂. Head and collar dark reddish brown, thorax and abdomen grey brown; antennæ ciliated. Fore wings bluntly angled about middle of termen, apex slightly produced; grey brown tinged with lilacine, costa sprinkled with black, discoidal spot black; postmedial line dark brown, oblique, outwardly pale edged, indistinct towards the costa; terminal line black, lunular; fringes pale. Hind wings angled on middle of termen; grey brown, tinged with lilacine; medial line dark brown, inner edge diffuse, outer edge pale; terminal line dark brown, interrupted at veins towards the costa; fringes pale. Under side pale brown, suffused with fuscous, discoidal spots black; traces of a dusky medial and postmedial lines indicated by black dots on all the wings.

♀. Termen of all the wings crenulate, angled at middle; the apex of fore wings more acuminate than in the male. Colour and marking agree with these characters in the male, except that the medial line on under side is more distinct.

Expanse, 36 millim. ♂; 40 millim. ♀.

Two male specimens from Kanshirei, one taken in May and the other in July, 1908. The July specimen has been described, the May specimen is rather browner in colour and the transverse lines are somewhat broader.

The female type, also from Kanshirei (Wileman), is in the British Museum.

*Zethenia crenulata*, sp. n.

♂. Head pale brown, thorax dark brown, darker behind; abdomen whitish speckled with dark brown and tinged with ochreous on the posterior edges of segments; antennæ ciliated, whitish marked with dark brown on basal third, and dark brown marked with whitish on remainder. Fore wings whitish sprinkled and clouded with purplish brown, costal and dorsal areas, also the venation, tinged with ochreous; antemedial and medial lines purplish brown, oblique, obtusely angled below costa; postmedial line formed of black dots on the veins, the costal three largest; space between medial and postmedial lines clearer of brown sprinkling than other parts of the wing; subterminal line blackish, white marked, only distinct towards the costa, followed by a short streak from the apex. Hind wings whitish sprinkled and clouded with purplish brown, the clouding chiefly on basal and terminal areas; discoidal spot black, medial line purplish brown, attenuated towards costa; postmedial line represented by black dots on the veins. Under surface similar to the upper side.

Expanse, 46 millim.

Collection number, 1886.

A male specimen from Arizan (7300 ft.), August, 1908.

Comes near *Z. inaccepta*, Prout, but the termen of all wings crenulate, deeply on the hind wings.

*Arichanna flavitincta*, sp. n.

♂. Head pale ochreous brown, antennæ bipectinated; thorax black brown, mixed with pale ochreous brown; abdomen pale ochreous brown, barred with black brown. Fore wings yellowish white, dotted and clouded with blackish, the clouding heavy and more or less confluent on basal half; costa and termen marked with yellow; two white spots, separated by a vein only, before the apex; an irregular edged blackish band from the lower spot to dorsum, the band traversed by an irregular brown line. Hind wings creamy white inclining to yellowish, densely dotted with blackish; discoidal spot blackish, large, its lower edge connected with a blackish band running to dorsum; subterminal line blackish; irregular and interrupted. Fringes of all wings blackish marked with yellow. Under side very similar to the upper side.

Expanse, 50 millim.

Collection number, 1818.

A male specimen from Rantaizan, May 7th, 1909.

*Arichanna ochrivena*, sp. n.

♂. Antennæ bipectinated; head and thorax blackish brown, the latter ochreous mixed; abdomen paler brown, suffused with fuscous on the back. Fore wings whitish, tinged with ochreous on the disc; costa and veins ochreous; subbasal, double antemedial, and double postmedial lines represented by black spots, costa striated with black, discoidal mark black, large; subterminal line represented by round black spots; a series of quadrate black spots on the termen, some towards costa united with subterminal series; fringes ochreous marked with black. Hind wings ochreous, suffused with blackish towards the base; discoidal spot black, almost round; medial line represented by five black spots, first on costa, second in line with discoidal; postmedial line represented by five black spots, the first between veins 4-6 and in line with the discoidal, the second minute, and the fourth and fifth hardly separate; seven black spots on the termen, the fourth, fifth and sixth larger than the other four. Under side ochreous, black spots as on the upper side.

Expanse, 56 millim.

Collection number, 1552.

A male specimen from Arizan, August 18th, 1908.

Closely allied to *A. hamiltonia*, Swinhoe.

*Perizoma rantaizanensis*, sp. n.

♀. Head white, mixed with black; thorax black, mixed with white, collar brown tinged; abdomen dark grey, brown marked. Fore wings white, flecked with grey brown; basal patch black, limited by an almost straight white line; antemedial line black, slender, excurved to median nervure, thence almost straight to dorsum; space between subbasal and antemedial line brownish;



postmedial line represented by black points on the veins; medial shade greyish, enclosing black discoidal dot; terminal area brownish, traversed by a white wavy subterminal line, and divided by a whitish spot between veins 3 and 4; the costal portion of terminal area is quadrate in shape, rather darker in tint, and edged with black. Hind wings whitish with black discoidal spot and two indistinct transverse lines beyond. Under side whitish sprinkled with grey brown, all the wings have a dusky discoidal dot; subterminal line on fore wings indicated by white dots; postmedial line on hind wings dusky.

Expanse, 26 millim.

Collection number, 1803 A.

A female specimen from Rantaizan, May 8th, 1909.

*Perizoma ochreotincta*, sp. n.

♂. Head whitish brown, thorax pale brown tinged with reddish ochreous and marked with blackish; abdomen grey brown marked with darker brown. Fore wings whitish brown tinged with reddish ochreous; basal patch black, limited by a whitish excurved line; medial band black, the inner edge indented below costa and again before dorsum, the outer edge bilobed about middle, both edges whitish; postmedial line dark brown, wavy, followed on costa by a blackish mark enclosing three white dots; terminal line black, fringes whitish brown, dotted with black at ends of the veins. Hind wings whitish suffused with fuscous. Under side whitish suffused with fuscous brown marking of upper side showing through on the fore wings; two slightly curved bands on the hind wings.

Expanse 18 millim.

Collection number, 1800.

A male, in rather poor condition, from Rantaizan, May 7th, 1909. There is a specimen from Formosa (Wileman) in the British Museum.

Allied to *P. decorata*, Moore.

*Perizoma arizanensis*, sp. n.

♀. Fore wings whitish, tinged with ochreous; basal patch black, limited by a slender white line, which is slightly angled below costa and turned inwards before dorsum; medial band blackish, limited by white-edged wavy black lines, and traversed by an interrupted wavy black line; space between basal patch and medial band clouded with greyish-brown; terminal area blackish, divided at middle by a large white spot which is freckled with greyish-brown; subterminal line indicated by white dots, connected towards costa; terminal line black, interrupted; fringes pale greyish-brown, paler at base and tips. Hind wings whitish, traces of a dusky discoidal dot and transverse line beyond. Under side of fore wings whitish fuscous tinged, traces of the upper side markings; hind wings whitish, speckled with greyish-brown, discoidal dot and interrupted postmedial line black, traces of a dusky subterminal line.

Expanse, 26 millim.

Collection number, 824.

A female specimen from Arizan (7500 ft.), September 15th, 1906.

Near *P. affinis*, Moore.

*Ochyria mediofascia*, sp. n.

♂. Head and thorax greyish white, the latter darker mixed; abdomen greyish white, mixed and banded with darker; antennae ciliated. Fore wings greyish white, powdered with darker; subbasal line black, almost straight; antemedial band black, parallel with the subbasal line; postmedial band represented by three fine black sinuous lines, filled in with blackish at costal end, approaching the medial band on dorsum; two blackish marks on the costa before apex; terminal line black, interrupted; fringes grey, paler at base and tips. Hind wings whitish suffused with fuscous, indications of three dusky medial lines. Under surface whitish, suffused with fuscous on the fore wings, and powdered with dark greyish on the hind wings.

♀. Similar, but the costal extremity of postmedial not filled in with blackish.

Expanse, 28 millim.

Collection number, 1804.

A male from Arizan, March 2nd, 1908; and a female from Rantaizan, May 9th, 1909.

Closely allied to *O. designata*, Hufn., the North American form of which it closely resembles.

*Ochyria viriditincta*, sp. n.

♀. Head and thorax dark grey brown, abdomen rather paler. Fore wings pale olive green, basal patch and medial band purplish grey; the basal patch is outwardly limited by a slightly waved black line; the medial band (which is traversed by two faint wavy black lines) is edged with black, the inner edge indented below costa and again near dorsum, the outer edges sinuous and bent outwards about middle; terminal border purplish grey, tinted with crimson between veins 3 and 5, interrupted towards costa by an oblique streak of the ground-colour from apex, the border is inwardly edged by a dentate black line; space between terminal border and the medial band traversed by a wavy olive line; space between medial band and basal patch transversely clouded with greyish; fringes dark grey, paler at base. Hind wings whitish, suffused with fuscous inclining to blackish on basal two-thirds; fringes pale grey, marked with darker at ends of the veins. Under side fuscous, marking of upper side of fore wings traceable; the hind wings have a blackish discoidal dot, a diffuse blackish sinuous postmedial line, and traces of a dusky subterminal band.

Expanse, 34 millim.

Collection number, 1878.

A female specimen from Arizan (7300 ft.), May, 1908.

Resembles *O. suffumata*, Schiff.

## NOTES AND OBSERVATIONS.

**PIERIS BRASSICÆ LARVÆ IN JANUARY.**—On January 17th, in a garden at Southfields, Mr. H. J. Lee took thirteen nearly full-grown larvæ of *Pieris brassicæ*, which he describes as feeding greedily on cabbage at the time of their capture. It was a very sunny day but cold; five degrees of frost had been registered in the early hours of the morning. Mr. Frohawk, whose life-histories of our British Butterflies are now appearing serially in the 'Field,' records three other instances of the full-fed larvæ in January. Two of these may be found in the 'Entomologist' for 1908, pp. 39, 62.—H. WORSLEY-WOOD; 31, Agate Road, Hammersmith, W.

**HIPPOTION (CHÆROCAMPA) CELERIO AT CHESTER.**—"Come into our house, there's a big moth flying against the window and making such a noise!" So exclaimed the next-door neighbour of Mr. A. E. Goodman, of Laburnum Lodge, Boughton (a suburb of Chester), one evening at dusk, in mid-September, 1910. Mr. Goodman went and captured the moth with his hands, I believe, put it in a box, and there it remained until a few days ago, when he wondered if it would be of use to the Grosvenor Museum collection. It is hardly necessary to say the Museum was without a specimen, and that the gift was gladly welcomed. The Curator, Mr. A. Newstead, F.E.S., at once pronounced it to be *celerio*. Now that it is relaxed and set it shows damage to both left wings, is minus antennæ (which may yet turn up), and it is also minus some legs. But the wings on the right show that the moth, on entering the room (attracted by the light), had been in excellent condition, and probably had not flown very far. The only other Cheshire record I can find of a capture of the species appears in Day's List, "Alderley Edge, in May, 1878 (W. W. Keyworth, Ent. xi. p. 160, E. L.)."—J. ARKLE; Chester.

**ARASCHNIA LEVANA.**—With reference to Mr. Ekins' inquiry (Entom. xlviii. p. 44) as to which brood of *A. levana* was taken in the Forest of Dean last July, I may say that all I saw were of the second brood, in which the upper side is black with a broken white band across the wings. Thus, at first glance, they bear a strong resemblance to dwarf *sibylla*, and the few seen on the wing seemed to sail along with all the grace of that butterfly, but they were mostly observed settled with wings expanded, which fact was probably due to the generally dull weather experienced—rain, more or less, every day and overcast skies. Still, evidently the weather was not altogether too bad for them, as I obtained ova from a female and succeeded in rearing a few to pupa. The green ova were deposited in strings or chains of about a dozen, suspended from the under side of a nettle leaf, and appeared to be well protected by their similarity to the pendant green seeds of the nettle. The larvæ were not gregarious, although when young half-a-dozen or so, independent of each other, would take up their abode on the under side of a single leaf, and eat small holes through it. When full-fed, however, they might easily be mistaken for half-grown larvæ of *Vanessa urticae*. The chief difference noted was the absence of the yellow colouring of *urticae*,



which was replaced by a kind of brownish-buff. The pupæ are angulated, after the usual manner of Vanessids, and are of a mottled or variegated brown. Given a favourable winter and immunity from the attacks of the Forest ants, there seems no reason why *levana* should not be seen again in the coming season.—G. B. OLIVER; Park Road, Sutton Coldfield, February 16th, 1915.

LEPIDOPTERA AT HEATHER BLOOM.—While at Penmaenmawr in July last I found that sugar, as an attraction for moths, was a failure. On several occasions, however, insects were fairly plentiful on heather bloom. Among other species *Agrotis ashworthii*, *A. lunigera* (in numbers), *A. lucernæ*, *Mamestra furva*, and *Acidalia contiguaria* visited the heather.—R. TAIT, jun.; Roseneath, Ashton-on-Mersey, Cheshire.

EURYMENE DOLABRARIA IN SCOTLAND.—In looking through South's 'Moths of the British Isles,' I notice that *E. dolabraria* is hardly known to be found in Scotland. It may be of interest to state that early in September, 1911, I took several larvæ on a beech hedge near Killin, Perthshire, N.B. Surely this cannot have been a casual occurrence?—J. G. BRYANS; Arundel House, Hayling Island.

TINEA MISELLA IN GLOUCESTERSHIRE.—Amongst some of my last year's captures submitted to W. E. Meyrick, F.R.S., he has referred a specimen taken at about 8.30 p.m. on Stroud Railway Station on May 21st, 1914, to this species. It appears to be new to our local list.—C. GRANVILLE CLUTTERBUCK, F.E.S.; 23, Heathville Road, Gloucester, February 3rd, 1915.

MELLINIA (XANTHIA) OCELLARIS.—Mr. Jones is to be congratulated on his large capture of *Xanthia ocellaris* at Great Shelford (*antea*, p. 43). In point of numbers it is probably a record for any single locality in this country, and is certainly, so far as the records and my personal knowledge go, the first occasion on which any number exceeding two or three have been taken anywhere outside a restricted area in the Thames Valley. Excluding this last named district, an examination of the records in our entomological journals shows that twenty-two examples in twenty-two years have been captured from ten localities, all in our east and south-east counties, with the exception of one in 1889 from Coxhame, Gloucester. Two only of the twenty-two were of the banded form—ab. *intermedia*, Habich. The salmon-pink insect is no doubt a typical *ocellaris*, Bkh. which varies a good deal in its ground-colour. The male with dark wings if without any trace of ochreous or reddish, and with the pale veins prominent, is ab. *lineago*, Gn., a rare form in Britain. The food-plant of the species in Central Europe is always given as black and Lombardy poplar. In the Thames Valley it is quite certainly the hybrid *Populus serotina*. Aspen, willow and common elm have also been suggested, but without any corroborative details except in the case of the first named. Mr. Jones's note gives good ground for adding wych elm to the list, but it is an addition which cannot be regarded as surprising, when it is remembered that the congeners *gilvago* and *fulvago* both feed on poplar and elm, though the more



usual food of the last named is, of course, sallow and willow. The only obscure points in the life-history of *ocellaris* concern the later larval stages, and it is to be hoped, as elm is a very easy tree to work—poplar is, of course, very difficult—that they may be cleared up in the coming season. On the Continent the larva begins its life on poplar until brought down by storm or rain, when it becomes a general feeder. *Artemisia campestris* is the only plant I have seen mentioned by name. Freitschke gives a detailed account of larvæ collected thereon in the neighbourhood of Darmstadt, and it would be worth while for Suffolk and Norfolk collectors to examine their local worm-wood in late May, if found growing anywhere near poplars of the black or Italian variety. Knowledge of the wild larvæ in Britain is at present confined to seven specimens taken in some twelve visits which I made to the haunt of the species in April and May, 1913. All were taken in association with poplar. No larvæ have been found on any of the plants growing near the tree, though diligent search has been made by several collectors over a period of several years. No one, I think, has succeeded in getting bred larvæ to accept any kind of "low-plant." This suggests a change in larval habit, and may account for the usual scarcity of the insect in the localities where it appears to be firmly established. This is, perhaps, a good opportunity to ask if any of your readers have at any time found *gilvago* in any shape associated with poplar? In Seitz's 'Macro-Lepidoptera,' vol. iii., Warren, dealing with the Continental *Cosmia* (*Mellinia*) *erythrago*, an insect long regarded as a variety of *gilvago*, remarks that all the Continental poplar feeding *gilvago* will probably prove to be *erythrago* (European authors are quite definite on the point that *gilvago* does feed on poplar), and supports his case by stating that in Britain *gilvago* feeds solely on elm. I do not know what authority there is for so positive an assertion; it is probably based on the knowledge that as *gilvago* larvæ can be beaten out of elm, nobody has troubled to look any further. In the Thames Valley certainly, and I have no doubt elsewhere, *gilvago* does feed on poplar. I also want first-hand information as to how the wild *gilvago* female lays her eggs. I do not want to be told on elm (or poplar), but when and how?—H. WORSLEY-WOOD; 31, Agate Road, Hammersmith, W., February 5th, 1915.

AN ENTOMOLOGICAL TRIP TO ST. ANNE'S-ON-THE-SEA.—I spent the first week in August at St. Anne's-on-the-Sea with my friend, G. Brooks, and as I learned from a local collector, Mr. A. Murray, that few but northern collectors visit this spot, the following notes may be of interest. The number of lepidopterous species at St. Anne's is not great, owing to the restricted flora, there being little besides the usual sandhill plants, hedges are almost unknown, and the only trees are willows and an occasional poplar; dwarf sallows, however, are abundant. I need hardly say our first visit was to the *Luperina guenéei* ground, the extremely confined area of which had been previously indicated to us by a friend. It is interesting to note that this once priceless moth had been all the while within a stone's throw of the local collectors, its habitat being at the edge of one of their favourite haunts. This is, however, easily understood when I

say that the portion of the coast on which the insect dwells is almost bare, there being only about six blades of grass to the square foot, besides which the land is occasionally flooded. On the way a few *Chrysophanus phlæas* were netted, but were of the usual summer form, and beyond some var. *cæruleopunctata* were quite typical; a few *Pararge megera* and *Epinephele ianira* were also seen. We then accidentally met Mr. A. Murray, to whom much of the success of our trip was due, for in addition to accompanying us, whenever possible, he placed his valuable local knowledge freely at our disposal. We proceeded to search for pupæ of *L. guenéei*. These may be obtained by raking the sand with the fingers when the sand is perfectly dry and capable of being drifted by the wind, and where the grass seems half dead. The pupæ are not deeper than an inch or two, and tumble easily out of their frail cocoons, and as they have the helpful habit of wriggling to the surface after disturbance, it is advisable to pay a second visit for those overlooked. We found one or two imagines struggling on the sand, apparently knocked off the food-plant by our raking about. We went for the imago in the evening, but owing to rain collecting was none too pleasant, and though we searched carefully we could not see a single specimen of *L. guenéei*. Mr. Murray, who was a little way behind, came up to us and said: "Can't see any! Why there are one, two, three, four, five quite close to you," and so there were, as we could readily see when they were pointed out to us. The difficulty of seeing this moth *in situ* is hard to realize until you start to work for it. It clings low down on its food-plant, quite close to the sand, the colour of which it closely mimics, and unless you shine your light about six feet ahead of you, on to the grass, you stand small chance of taking the species in quantity, as it appears not to fly. The females, I should say, never fly, as their bodies are very heavy, and the wings do not appear to be capable of supporting them. The male is rare, and not so often taken as the female. Probably if a sheet were erected the male would be found to come to light, but not in large quantities, as the proportion of males bred from pupæ was very small. The species is abundant in its restricted haunt, but is in danger of extermination at St. Anne's, as the Council are building a new Promenade along the sea-front, and will soon be up to the *guenéei* locality which it will cover. On our return home that evening we glanced at the ragwort heads, and, though raining heavily, we took a nice series of *Hydrewia nictitans* var. (? species) *paludis*, *Miana literosa*, *M. furuncula* (the St. Anne's form of this latter species seems to be very light, practically a unicolourous, pale ochreous grey), one or two *Agrotis tritici* and a few *A. nigricans* var. *fumosa*.

The next evening was devoted to ragwort heads on the Blackpool side of the town; there was a strong cold wind blowing in from the sea, so conditions were far from perfect; nevertheless, moths were on the heads in plenty, but the violent movements of the blossoms made boxing and selection a very difficult task. We experienced this difficulty every night, and though we tried to select a more or less sheltered dip in the dunes, it was generally impossible to escape the wind. The Agrotids did not seem to mind how strong a gale was

blowing, clinging very tightly to the ragwort. *A. tritici* was in thousands; every modification in marking and colour seemed to be represented. Some of the selected forms we brought home are very beautiful, but not so large as the few I took at Wicken in 1911. It is curious to note that the dull brown Wicken form seems to be very scarce at St. Anne's, and never so large. I took one with the wings a deep greyish fuscous, the costa broadly marked in pure snow white; there also are other pure white longitudinal marks along the nervures; a number of specimens we took have costa creamy white, but only one with the costa beautiful pure white. *A. cursoria* was there, too, in quantity, but not so commonly as *A. tritici*. One plain unicolorous form, without markings, except the black dot at the lower half of the reniform stigma, was captured, and worthy of mention, as Mr. Murray said he had rarely seen such a good example of this obsoletely marked form.

Another evening was spent in the *guenéei* ground, where we also obtained some beautifully fresh *Noctua umbrosa*; this insect, though usually taken in poor condition, was to be secured on the ragwort here in perfect state. We made one journey north of Blackpool to see if any belated larvæ of *Nyssia zonaria* were left. It was very easy to find where they had fed, but a long search only produced one larva; two pupæ were raked out of the sandy soil. The larva appears to be polyphagous, but shows a decided preference for *Lotus corniculatus*. In the evening we went to Lytham in search of *Mamestra albicolon* larvæ, these we obtained in fair abundance, together with the larvæ of *Agrotis ripæ*, feeding on the sea-plantain: they were of all sizes, from half-an-inch till practically full-fed. Mr. Murray said he had never found any difficulty in rearing them, but when we got them to London ours did not thrive, owing, perhaps, to the different atmospheric conditions. They readily ate the broad-leaved plantain with which we supplied them, but all became affected with diarrhoea and died. We found growing on a marshy patch quite close to the sea, at Lytham, a short fine species of rush, the flowers of which were a most attractive bait, *cursoria* was most abundant on this. I might also mention we took one or two *Eubolia limitata*; these were of a very rich dark brown, and very different to the southern forms of this insect. *Cidaria testata* was the only other Geometer we saw commonly, but they were rather worn, and do not appear to be very different from the Hampshire forms I have. Mr. Murray also showed us how to take larvæ of *Dicranura vinula* and *Smerinthus ocellatus* on the dwarf sallows, which abound on the sand-hills. His method was to notice where the twigs had been stripped of their foliage, then search the ground immediately beneath for frass; if this was fresh, he carefully searched the bush and generally found a fine full-fed *D. vinula* or *S. ocellatus*. The marvellous way in which these larvæ are protected can only be appreciated by actual searching. In fact, we found the best way to obtain them, once having the frass clue, was to feel along the branches. We took a number of *Eupithecia* larvæ from ragwort, but we have not yet been able to determine the species.

The following is a list of species observed, the practical absence of Geometers being worthy of note:—*Pieris brassicæ*, *P. rapæ*, *P. napi*,



*Chrysophanus phlæas*, *Lycæna icarus*, *Vanessa urticae*, *Pyrameis atalanta* (one only), *Pararge megæra*, *Satyrus semele*, *Epinephele ianira*, *Orgyia antiqua* (larvæ and pupæ), *Leucania pallens* (one only), *L. impura*, *Hydræcia paludis*, *Xylophasia monoglypha* (polyodon), *Charæas graminis*, *Cerigo matura* (cytherea), *Spilosoma lubricipeda* (larvæ), *Hipocrita jacobææ* (larvæ), *Leucania lithargyria*, *Luperina testacea* (imago and pupæ), *L. guenéei* (imago and pupæ), *Apamea oculatea*, *Miana literosa*, *M. furuncula*, *Agrotis valligera*, *A. nigricans*, *A. tritici*, *Noctua rubi*, *N. umbrosa*, *N. baja* (two), *Triphaena pronuba*, *T. comes*, *Acronycta megacephala* (larvæ), *Dianthæcia capsicola* (larvæ), *Eubolia limitata*, *Nyssia zonaria* (one larva and pupæ), *Agrotis exclamationis*, *Plusia gamma* (imago and larvæ), *Smerinthus ocellatus* (larvæ), *Dicranura vinula* (larvæ), *Mamestra brassicæ*, *Hydræcia micacea*, *Caradrina blanda*, *C. morphæus*, *C. cubicularis*, *Stilpnotia salicis* (one female), *A. cursoria*, *Noctua xanthographa*, *Mamestra albicolaria* (larvæ), *A. ripæ* (larvæ), *A. præcox* (three) *Zygæna filipendulæ*, *Eupithecia centaureata* (two), *Triphosa dubitata* (one), *Hadena oleracea* (larvæ), *Amphipyra trago-pogonis*, *Nænia typica*, *Crocallis ellinguaria* (one), *Lygria testata*, *Camptogramma bilineata*, *Pelurga comitata* (one). We returned home on August 6th, perfectly satisfied with our captures and thoroughly braced up, thanks to the wonderful air of St. Anne's.—  
B. S. WILLIAMS; January, 1915.

NOTES ON LEPIDOPTERA ATTRACTED BY LAMPS AT BEXHILL-ON-SEA.—I came to reside at Bexhill in the autumn of 1913, and as I did not know or come across any other resident lepidopterist, I had to find a hunting-ground for myself. During the autumn I pitched upon a very promising run of lamps, which this enterprising borough has extended from Bexhill to the village of Little Common, over a mile distant. As I took between two and three hundred species of Macro-Lepidoptera, the record may be of some interest. Though not traversing actual woodland, the road has a nice sprinkling of trees and plantations in its vicinity, especially oldish oaks and poplars, with some birch and Scotch fir (*Pinus*), and the thick hedges have plenty of sallow. The season was very favourable in one respect, *viz.* absence of wind, which is the great drawback to "lamping," especially at a very breezy seaside resort like Bexhill. The other chief drawback, however, the bats, were excessively abundant here, every British species, I should say; and one or more appeared to derive a living from each lamp. They certainly "bagged" half the insects. Lastly, the lamps were extinguished at a variable time between 11 and 12 p.m., always earliest on the most favourable nights!

January, February and March.—Although (perhaps "because"?) the autumn and winter were exceptionally mild, the species of *Hybernia* were very late in appearing. The first *H. rupicaprarica* came to my window on February 19th, and I had looked in vain for it on the hedges previously. It is less addicted to light than the rest of the genus however. February 24th—*H. marginaria* appeared, and was thenceforth abundant, as was *Anisopteryx æscularia*. March was so miserably wet and blustering that I seldom turned out, but on



the 31st I took *Melanydris multistrigaria*, *Taniocampa munda* and *Xylocampa arcola*, as well as *T. gothica*, *T. stabilis*, *T. cruda*, *T. incerta*, *T. gracilis*, and *Pachnobia rubricosa* on this and following days.

April 1st.—*Pachys strataria* (two). 2nd.—*T. munda*, *Melanydris multistrigaria*, first appearance of *Selenia bilunaria* (excessively abundant thereafter). 4th.—*T. opima* (one). 10th.—*Anticlea badiata* (very abundant later). 20th.—(A good night, east wind dying away to warmth) *Drymonia chaonia* (one), *Anticlea nigrofasciaria* (two). 21st.—A remarkable overlapping of the seasons; I took *Dicranura vinula* and *Noctua plecta* at a lamp on which were several *H. marginaria*. Also *Selenia tetralunaria* (two) and *Lobophora carpinata* (*lobulata*). 23rd.—*Triphosa dubitata* (one), *Diaphora mendica*. 24th.—*Cilix glaucata*, first appearance of *Spilosoma menthastri*, which continued out till end of July. *Anticlea badiata* and *Selenia bilunaria* were a perfect pest. 29th.—*Coremia designata* (subsequently very abundant, and a few second brood in August), *Tephrosia crepuscularia*.

May 13th.—*Gonodontis bidentata* and *Caradrina quadripunctata* at windows. 14th.—*Cucullia chamomillæ* (one), first appearance of *Dasychira pudibunda* and *Coremia ferrugata*, outburst of "cock-chafers" called "May-bugs" in Sussex; I counted dozens under one lamp. 18th.—*Drymonia chaonia* (two). First appearance of *Pheosia tremula*, *Lozogramma petrarica*, *Ephyra punctaria*, *Lomaspilis marginata*. 19th.—*Notodonta ziczac*, *D. chaonia* (one), *Cucullia chamomillæ* (one). First appearance of *Amorpha* (*Smerinthus*) *populi*, thereafter frequent, also appeared early in July (query, late first or early second brood). 20th.—*Abrostola urticæ*, *Noctua rubi* appeared. 21st.—*Notodonta trepida* (one, laid many eggs, but youngsters died of plague), *Cerura bifida* (two), *N. ziczac*, *Ephyra pendularia*; *Aspilates ochrearia*, first brood common, as was the second brood in August. 27th.—First *Grammesia trigrammica* (common later), and *Plusia gamma*. 28th.—*N. trepida* (one), *Smerinthus ocellatus*; first appearance of *Iodis lactearia* and *Perizoma flavofasciata* (both abounded afterwards over a very long season). 29th.—*N. trepida* (one), *Agrotis strigula*, *Mamestra genistæ*. 30th.—*Dianthuccia carpophaga*, *Drepana binaria*, and *D. lacertinaria*.—ERNEST A. C. STOWELL; Laleham, Bexhill-on-Sea. (To be continued.)

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, November 4th, 1914.—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Mr. Alleyne Leechman, M.A., F.L.S., F.C.S., of Corpus Christi College, Oxford, and St. Hubert's, Main Street, Georgetown, British Guiana; Dr. T. Miyaké, the Agricultural College, Tokyo Imperial University, Koniaba, Tokyo, Japan; and Mr. George W. Murray, Dirimu Estate, Binaturi River, Daru, Papua, were elected Fellows of the Society.—On the motion of the Presi-

dent, a resolution was unanimously passed associating the Society with the reply published in the 'Times' to the declaration of certain German professors with regard to Great Britain's responsibility for the war. The Rev. F. D. Morice then proposed the following resolution:—"That all members of recognised Entomological Societies in the countries of our Allies, residing in or visiting this country, be invited during the continuance of the war to attend the Ordinary and Annual Meetings of the Society, and to make use of the Society's Library, in the same manner as though they were themselves Ordinary Fellows, except as to the right of voting." This was seconded by Dr. Burr, and carried unanimously.—Commander Walker exhibited, on behalf of Dr. R. C. L. Perkins, specimens of *A. trifolii* and *P. plantaginis* showing the effects of isolation, and read notes contributed by Dr. Perkins. Commander Walker also exhibited, on behalf of Mr. Morris N. Watt, of New Zealand, a photograph of a "*Weta*" (*Deinacrida* sp.) fully winged, the species being usually apterous.—Mr. A. H. Jones exhibited a series of *Colias erate*, from Sarepta, and its supposed hybrids, with *C. hyale* and *C. edusa*.—Dr. G. B. Longstaff exhibited a fine series of *Meneris tulbaghia*, L., a large and handsome Satyrine butterfly having much the appearance and habits of a Nymphaline. A long and important discussion followed on the fondness of certain insects for flowers of a particular colour; and on the question as to which sex carried the other during copulation in the case of different Rhopalocera.—Prof. Poulton read a letter, written June 27th, 1914, by Mr. T. R. Bell from Karwar, N. Kanara, in the Bombay Presidency, on the proportion of the female forms of *Papilio polytes* in North Kanara; also a letter, dated October 6th, 1914, from Rev. K. St. Aubyn Rogers at Sagalla, near Voi, British East Africa, on the male and female of *Acrea chilo* in coitū. Prof. Poulton exhibited the specimens and read a note contributed by Mr. A. H. Hamm, of the Hope Department, on males of *Ceratopogon myrmecophilus* and *Formicoxenus nitidulus* on the hillock of *Formica rufa* near Bournemouth.—Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited specimens to illustrate a paper by Messrs. Joicey and Rosenberg on new species of *Catacticta*.—The following papers were read: "Notes on the Life-History of *Plebeius zephyrus* var. *lycidas*," by T. A. Chapman, M.D., F.Z.S., F.E.S.; "Note on the Manubrium of the ninth sternite in the male Earwig," by Malcolm Burr, M.A., D.Sc., F.E.S., &c.; "The Opisthomeres and the Gonapophyses in the Dermaptera," by the same; "On the Male Genital Armature of the Dermaptera"—Parts I.—III., by the same.—Rev. GEORGE WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Dec. 10th, 1914.—Mr. A. E. Gibbs, F.L.S., Vice-President, in the chair.—Mr. W. Schmassmann, F.E.S., was elected a member.—Mr. W. J. Lucas read a paper, "The British Long-horned Grasshoppers," and showed a large number of lantern slides.—Mr. H. Moore, a drawer of Decticinae, Long-horned grasshoppers containing *Decticus albifrons*, *D. intermedius*, *D. tessellatus*, *D. verrucivorus*, &c.—Mr. Step, a long-horned grasshopper, *Hetrodes petersi*, female, from S. Africa, both sexes were said to be apterous.—Mr. A. E. Gibbs

referred to the two large British sawflies, *Sirex gigas* and *S. noctilis*, and exhibited their large parasite, *Rhyssia persuasoria*, from Berk-hampstead, Herts, and read notes on the species.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, November 16th, 1914.—The President, Mr. R. Wilding, in the chair.—Dr. W. J. Fordham, The Villa, Bubwith, near Selby, was elected a member of the Society.—The subject for the evening, entitled "The most interesting Field Observations made during the last Season," gave rise to a discussion which was entered into by most of the members present.—Mr. R. Wilding brought his collection of the genus *Bembidium* (Coleoptera), and made descriptive remarks upon the occurrence and peculiarities of each species, particularly mentioning the following, viz. *Bembidium 5-striatum*, *B. fumigatum*, *B. schuppeli*, *B. nigricorne*, *B. stomoides*, *B. lunatum*, *B. testaceum*, *B. anglicanum*, *B. fluviatile*, *B. prasinum*, *B. adustum*, and *B. argenteolum*.—Mr. A. W. Hughes exhibited a yellow variety of *Euchelia jacobææ*, a series of *Epinephele ianira*, including an example with strongly pupillate spots on the upper side of the hind wings, also a specimen of *Agriopsis aprilina* taken at sugar on the Crosby sandhills.—Mr. W. Mansbridge the following Micro-Lepidoptera, viz. *Tortrix pronubana*, bred from larvæ found in the palm house in one of the Birmingham parks by Mr. W. Bowater—the caterpillars were doing great damage to the acacias in the house; *Peronea variegana* with vars. *albana* and *cirrana* bred from Wavertree larvæ; *Mixodia schulziana*, a series from Delamere Forest, where it was plentiful, though not previously on record for the locality; *Pædisca solandriana*, selected varieties from Huddersfield and Hebden Bridge, West Yorks; *Ephippiphora trigeminana* from the sandhills at Crosby, very small specimens; and a fine series of *Eupæcilia dubitana*, light and dark forms from the same locality.—WM. MANSBRIDGE, *Hon. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—October 7th, 1914.—Exhibition evening.—The following were the exhibits:—Mr. Mansbridge showed a beautiful selection of Micro-Lepidoptera as follows: *Scoparia dubitalis*, *S. cratægella*, and *S. mercurella* from Silverdale; *S. angustea* from Hebden Bridge; *Mimæsoptilus bipunctidactylus*, a cinnamon-coloured form from Crosby; *Tortrix pronubana* from Birmingham, where it was damaging the acacias in the Palm House; *Peronea variegana* and vars. *cirrana* and *albana* from Liverpool; *Cnephasia politana* and *Mixodia schulziana* from Delamere; a varied series of *Pædisca solandriana* from West Yorks; and, finally, a very fine series of *Eupæcilia dubitana* from Crosby.—Mr. J. H. Watson, full-grown larvæ of *Attacus atlas* and *Actias selene calandra* from Andaman Islands; young and mature living specimens of *Pulchriphyllum crurifolium*, the great leaf-insect, reared on oak from ova from Ceylon.—Mr. B. H. Crabtree, Lepidoptera from Braemar, 1914; *Argynnis aglaja*, *Lycæna alexis*, *Plusia interrogationis*, *Noctua festiva*, *Zygæna exulans*, *Gnophos obfuscata*, *Thera simulata*, *Crambus myellus*, &c.—Mr. W. Buckley showed *Gonodontis*



*bidentata* from Mr. Bowater of Birmingham (all black forms), and from Urmston, nearly all dark forms; *Dianthecia conspersa* from Anglesey; *D. carpophaga* from Lewes, light forms; *Barathra brassicæ* from Urmston, with brown blotches on hind margins; a varied series of *Boarmia repandata* from Penmaenmawr, 1914; *Agrotis ashworthii* and *brunnea* from the same locality; also ichneumon from *A. ashworthii*.—Mr. R. Tait, jun., Lepidoptera taken at Braiscome, S. Devon, June 1914; *Leptidia sinapis*, *Polyommatus aleris*, blue females; *Zonosoma omicronaria*, *Z. linearia*, *Emmelesia affinitata*, *Bapta temerata*, *Asthena luteata*, *A. blomeri*, *Numeria pulveraria*, *Cidaria silaceata*, *C. picata*, *Hesperia malvæ* var. *taras*, and one ovum; also the following taken at heather-bloom at Penmaenmawr, July, 1914: *Agrotis lunigera*, *A. lucerneæ*, *A. ashworthii*, *Mamestra furva*; also *Boarmia repandata* bred from Sussex parents; *Ægeria culiciformis* from Delamere; *Plusia festuæ* and *Triphaena fimbria* from Carrington, both at sugar; a box of vars. of *Abraxas grossulariata*, including a number of fine var. *nigro-sparsata*, and one specimen having the two left wings black with a few white veinings on the margin, and the right wings more or less typical, all bred from Huddersfield larvæ.—Mr. C. F. Johnson, a long series of *Cenonympha tiphon* and some *L. icarus* showing a good deal of blue in the females; also a few *Hyria auroraria* of the purple moss form, all from Witherslack; some well-marked *Thera variata* and *Ellopiæ fasciaria*, showing a good range of colour, from Delamere.—Mr. L. Nathan, *Vanessa urticæ*, *Satyrus semele*, imago and cocoon both bred from Prestatyn larvæ, 1914; *Æschna cyanea*, a dragonfly caught in a city office, July, 1914; also *M. persicariæ*, from Stockport.—Mr. W. F. Windle, live specimens of *Parasemia plantaginis* (second brood), bred from ova taken at Forres in June.—Mr. J. H. Shorrocks, *Sirex gigas*, caught in a joiner's shop.—Mr. J. E. Cope, a selection of exotic Coleoptera, including large Longicornia from Singapore; Cetonides from the same district and from Africa; also large-horned Lamellicornia from Malay Peninsula, and several species of Coprides from Africa.

LONDON NATURAL HISTORY SOCIETY.—October 20th, 1914.—Mr. L. W. Newman exhibited a series of *Dianthecia barrettii* bred from wild larvæ and pupæ from Co. Cork and South Devon, the specimens being very varied, and a few showing tendencies to melanism. Also a very varied series of *Boarmia repandata*, including melanic specimens, very pale forms, and ab. *conversaria*, all from wild collected larvæ taken in April in the Wye Valley.—Mr. A. W. Mera, a series of *Psilura monacha* bred from ova received from Middlesborough, the original parents coming from Ringwood and North Kent. The specimens varied from typical to black, the males showing a stronger tendency to melanism than the females.—Dr. E. A. Cockayne, a series of *Agriades coridon* from Herts, 1914, including two very fine ab. *semisyngrapha*, and five fine obsolete forms.—Mr. V. E. Shaw, five very dark *Abraxas grossulariata* bred in 1914 from some two thousand North London larvæ. Also a fine ab. *radiata* from Eltham.—Mr. W. E. King, a fine series of varieties bred from North London, 1914.—Mr. L. A. E. Sabine, a



fine variety of *Melitæa aurinia* from Co. Sligo, also a remarkable *Polyommatus icarus*, having fore wings and body male, hind wings female, on superficial appearance.—Dr. Cockayne, having examined the specimen with a microscope, said that though only a low power was available he thought he could detect androecenia, showing that the specimen was gynandromorphous.—Mr. J. Riches, a series of *E. smaragdaria* bred in 1914, including ab. *obsoleta*, Burrows.—Mr. H. B. Williams, two pupæ of *Euchloë cardamines*, one green and the other ochreous, both of which pupated on the same day, in the same box.

THE DERBYSHIRE ENTOMOLOGICAL SOCIETY.—The Annual Meeting for exhibits was held on October 31st, 1914, at Littleover House, Derby.—The President was unable to attend on account of the inclement weather, and Dr. Winstan St. A. St. John occupied the chair.—Mr. James Douglas exhibited two cases containing a complete series of the various species of Wainscots, including specimens of *hessii*, Boisdl., *favicolor*, and *brevilinea* ab. *sinelinea*, Farn. Also a superb series of *Caradrina exigua*, picked out of a large number taken by himself at Freshwater in August and September, 1906, amongst which was a specimen, probably unique, with extraordinarily enlarged stigmata.—Mr. H. C. Hayward contributed a drawer containing over four hundred *Eupithecia*, comprising thirty-five species, twenty-four of which were local specimens, including *albipunctata* var. *angelicata*, *tresignaria*, *sobrinata*, and *dodoneata*. Also a box of local specimens, including melanic forms, particularly of *Cabera pusaria* and *Boarmia repandata*. Of species locally rare there were specimens of *Helotrophæ leucostigma* var. *fibrosa* and *Tæniocampa opima*, the latter hitherto unrecorded in Derbyshire. *Sesia scoliformis* from Cannock Chase, *Cirrhedæa xerampelina* var. *unicolor* and *Macaria liturata* var. *nigrofulvata*.—Dr. St. John showed specimens of inbred *Abraxas grossulariata* var. *varleyata*, and also a long graduated series from dark to light with very few spots, bred from wild Derbyshire larvæ, all from one bush. A long series of *Lymantria monacha* reared from New Forest ova, of which the males in particular were of dark smoky colour with suffused markings. A graduated series of *Ennomos autumnaria*, a specimen of *Lycæna corydon* var. *semisyngrapha*, and also *Vanessa urticæ* of a curiously dull shade.—Mr. John Hill, a box containing a very large number of beautifully preserved larvæ with the natural colouring remarkably clear and distinct.—Mr. C. F. Druitt, some of his captures on a recent holiday in the Isle of Man, amongst which were some *Zygæna trifolii* with the red spots suffused, so as to produce a red-spot variety.—The Secretary showed a series of *Epunda lichenea*, bred from larvæ taken on the Lincolnshire coast.—G. HANSON SALE, Hon. Sec.

ERRATUM.—Page 42 line 13 from bottom for 'Entomologist' for 1879, read 'Entomologist' for 1878.





INSIDE OF LEAF-GALL OF *P. REAUMURI*, KALT.

# THE ENTOMOLOGIST

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[No. 623

## NOTES ON A LIME TREE APHIS, *PACHYPAPPA REAUMURI* KALTENBACH, NEW TO BRITAIN.

BY FRED V. THEOBALD, M.A.

(PLATES IV. & V.)

A VERY marked leaf-monstrosity was noticed by Reaumur on the lime (*Tilia*) and figured by him (Ins. iii. pl. 23, figs. 1-3) due to the work of an aphid. The insect causing this malformation was described by Kaltenbach as *Schizoneura reaumuri* in 1843 (Mono. d. Pflanzenläuse, pp. 175-176); Ratzeburg in 1844 also listed it as *Aphis* (S.) *Reaumuri* Kalt. but only refers to it in a few words ('Die Forst Insecten.' iii. p. 221, 30). It has also been referred to by Kieffer in 1901 (Ann. Soc. Ent. Paris, t. 70, p. 532); Schouteden lists it from Belgium in 1903 (Ann. Soc. Ent. Belg. t. 47, p. 188). Del Guercio also gives some valuable notes on it with figures in 1904 ('Redia,' ii. fas. 2, pp. 306-315), and I quite agree with this aphidologist in placing it in Koch's genus *Pachypappa* ('Die Pflanzenläuse,' p. 269, 1857); lastly, Trotter in 1907 mentions it ('Marcellia,' Avellino, t. 6, p. 31, n. 26). Neither Buckton nor Walker refer to it as occurring in Britain, so that this is the first record of this evidently rare aphid and one which is of special interest.

Lichtenstein ('Les Pucerons, Monographie des Aphidiens,' p. 30, n. 58) appeared inclined to consider that Koch's *Pachypappa vesicalis* ('Die Pflanzenläuse,' p. 272, figs. 346-347) was the same as Kaltenbach's *Schizoneura reaumuri*; Del Guercio first clearly pointed out that they are very distinct, *vesicalis* being a poplar insect, whilst *reaumuri* lives on *Tilia* or limes. There is no doubt on this point, but they both belong to the same genus called *Pachypappa* by Koch.

In June, 1914, Mr. E. E. Green sent me alive specimens of these insects from Bearsted, Kent, and on the 13th of that month I visited the locality, and through the kindness of his sister found them swarming on a broad-leaved lime tree in her garden. It was causing a very unsightly appearance to the tree and was undoubtedly doing a considerable amount of harm to the foliage. More than this, it was a great annoyance on



account of the vast numbers of ants it attracted to the tree. I found the curious galled leaf masses or "topnots," as Del Guercio describes them (Plates IV. and V.), in great quantities on this particular tree, and also elsewhere in the locality. They appeared to occur chiefly low down—not many could be seen higher up than twenty feet from the ground. Many were present on the tops of the suckers around the base of the tree.

This aphid has been recorded as feeding on *Tilia grandifolia*, *T. parvifolia*, *T. argentea*, and Del Guercio refers to it on *T. europæa*, Linn., *T. platyphylla*, Scop., and *T. argentea*, Dec., in Italy. The leaf-galls, for one can call them by no better name, are very marked, but vary somewhat in form.

The usual type I found (Plate IV. A) has one large leaf rolled up in cigar fashion, with the top of the shoot and the smaller terminal leaves crumpled up inside; the stalk is markedly bent over just before the final "leaf-gall" arises. Sometimes this form is somewhat irregular. The second type (Plate IV. B) has the large outer leaf bent over from above downwards and backwards, forming an irregular triangular mass, with often the sides of the leaf folded laterally over the median portion. The longest galled mass I found was a little over four inches in length. The inner crumpled leaves and contorted, stunted shoot were more or less chlorotic, and sometimes the outer leaf was paler than usual. The tip of the shoot is often very much twisted and lies with the smaller terminal leaves in a crumpled mass inside the large outer curled leaf. The leaves, both internal and external, were remarkably crisp, and broke at the least touch; this was also pointed out, I find, by Del Guercio.

Later on I noticed the whole leaf mass turned brown and died, due to the constant sucking of the masses of insects sheltered within, and to the quantity of very sticky honey-dew that they produce.

At the time of my visit to Bearsted the leaf-galls were almost entirely tenanted by nymphæ, but here and there I fortunately found a large viviparous female, clearly an old "Queen" or "Fundatrix," and a few of her progeny in a later stage than that figured by Del Guercio. This viviparous foundress was 4 mm. long, one about 5 mm.; their form is globular and very bloated in appearance; the colour varied from deep greenish-brown or olive-brown to dark-brown, and one was a deep orange-yellow; in all, the head, antennæ, and legs almost black. The few young I noticed were the same colour as the countless nymphæ, which varied from dull yellow to yellowish or brownish green, the nymphæ having dark wing-pads and dark legs, and the head with dark marks; some of the nymphæ showed five pairs of small lateral tufts of white wool. In all the apteræ there now and then appeared a slight farinaceous coat.

One is at once struck by the relatively small size of the progeny of the large globular foundress, both in the apteræ and alatæ. At the time of my visit, very few alatæ were to be seen, but from material I brought away great numbers of alate females commenced to hatch out on the 15th, and continued to do so until the 20th. Roughly, within the week all had become winged, and this was also noticed by Del Guercio at Florence.

The alate viviparous females—the fundatrigenia—have a black head and thorax, antennæ, and legs, and a yellow-green to deep-green abdomen. The wings are somewhat smoky, with dark veins. The winged females were noticed to fly away from the trees, and those hatched out in the breeding jars at once flew away on being released, and showed if confined great agitation and apparent desire to migrate.

Those kept in a large breeding cage dropped their young on the soil. These very minute young were pale yellow, and whilst still very small crawled into the ground. Later I found them attached to the roots of grass and primroses growing in the breeding cage. The number of young produced by each female was not counted, but from the vast numbers found in the jars, it must be very great. This aphid then leaves the lime trees in June and, according to Del Guercio's observations in Florence, returns to them in September. Of this return to the lime I am unfortunately unable to speak, but I can fill in some of the intervening stages, which are spent in the soil, just as we find is done by the allied *Anæcia corni*, Fabricius, and the *Schizoneura ulmi*, Linnæus. The return migrants or sexupara come from the soil and produce the sexuales, and the ova deposited on the limes give rise to the "queen foundress," described here, and which deposits its young on the young tender top shoots; these seem to arrange themselves at first in a row up the shoot and then on the median ribs of the leaves. According to Del Guercio, who found this curious aphid in the Florentine gardens and neighbourhood, it occurs, as I have found it, "in the centre of bunches of leaves" in various kinds of *Tilia*. Del Guercio found infection in March and April in town gardens, and in June and July on the hills and more elevated positions above Pratolius on *Tilia platyphyllus*, Scop., and noticed that on this lime it rolled up the leaf, which it did not do in *Tilia europæa*. At Bearsted I noticed that this aphid was very largely attended by ants (*Lasius fuliginosus*), which formed a long black column coming from and returning to the garden near the attacked tree. The ants were found hurriedly passing backwards and forwards in a line about six inches wide, between their nest and the aphid-laden lime tree. There must have been thousands of them. Those going to the tree kept on one side, those returning from it on the other. The latter were frequently noticed to be carrying the aphids back with them. When the

ants had ascended the trunk, they spread out and swarmed amongst the dense masses of aphides in the leaf tufts, and then greedily sucked up the honey-dew. So intent were these ants on feeding that they would not leave the leaf-tufts even when violently shaken. They were noticed to carry the nymphæ back with them with great care, now and then putting them down and resting awhile, then hurrying on again with their captives. Mr. Donisthorpe tells me that the ants could not be taking them back to their nests, as plants do not grow on the nests of this ant. Probably, as this aphid is a root feeder during part of its life-cycle, they were carrying them back to plants near their habitations, so that the alatae could deposit their young close to them. If *Pachypappa reaumuri* is not a true myrmecophilous species, it comes very near to being so. It is certainly attended by ants who take pains to see that they occur in the soil close to their formicaries.

The characters of the different stages observed are as follows (and I here include the description of the progeny of the "Queen Foundress" more fully noticed by Del Guercio than by myself, the majority having reached the nymphal stage when I became acquainted with this insect).

#### APTEROUS VIVIPAROUS FEMALE (Fundatrix).

Length 3·8 to 5 mm. Globular in form, very convex above, flattened below. Deep greenish or olive brown to deep brown in colour, one being orange-yellow and some deep olive-green. Head, antennæ,

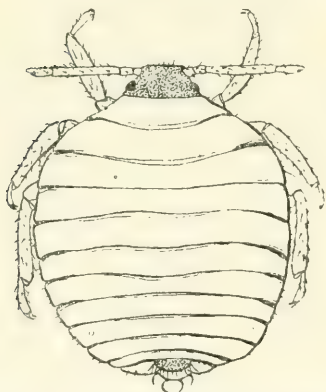


Fig. 1.—*Pachypappa reaumuri*, Kalt.  
(apterous viviparous female).

legs, and cauda black. Antennæ (fig. 2, c) not quite as long as the head and thorax; the first segment small, the second a little longer than the first, the third the longest, from two and a half to three times as long as the fourth; the third and fourth segments with scattered silky hairs all over; the first and second also with a few hairs, mainly on one side. The eyes are of moderate size, dark; stemmata pale and prominent. Rostrum thin and acuminate, pale at the base, dark on the apical half, reaching just past the base of the second pair of legs, the apical segment a little longer than the penultimate, the next long and thin. The legs are dark, thick, and rather short, with

short scattered hairs; the legs all project a little beyond the sides of the body. The body has the segments deeply constricted, especially dorsally; with fine, scanty, short hairs, and to some extent farinaceous, especially between the segments.

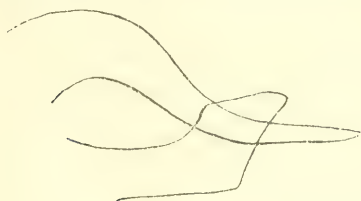
(To be continued.)

# ON THE SPECIFIC DISTINCTION OF *LYCÆNA* *CORETAS* AND *L. DECOLORATA*.

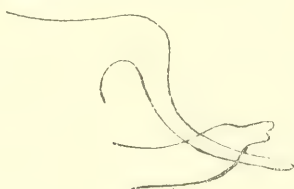
BY THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S., Pr.E.S.

MONS. CHARLES OBERTHUR\* was, I believe, the first to urge that *Lycæna argiades* and *L. coretas* were distinct species. This is now generally admitted to be the case.

In the Cséhtelek † district of Hungary three closely allied species of *Lycæna* occur: *L. argiades*, *L. coretas*, and *L. decolorata*. They all inhabit the open spaces in woods and localities where the forest has been cleared, but where the soil still retains its wild plant life. All three species are double-brooded.



*L. coretas*.



*L. decolorata*.

*L. decolorata* is generally supposed to be an aberration, or at best a dimorphic form, of *L. coretas*. An examination of the genitalia convinces one that this is not the case, and that the two insects are distinct species. In *coretas* the two prongs of the ninth sternite (sometimes called the penis support) are scarcely as long as the stem, while in *decolorata* they are at least as long as the stem.

It is, however, in the apical portion of the pleuræ of the ninth segment (the harpagones) that the two insects differ most. We figure these to show the difference.

It is quite possible that the two insects have different food-plants, and their larvæ may also differ.

## THE BUTTERFLIES OF THE BUCKS. CHILTERN.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 55.)

15. *Zephyrus betulae*, L. This butterfly, as a rule difficult, I think, to locate, should haunt the sloe bushes which form so conspicuous a feature in many of the hill lanes. I have no personal

\* 'La Feuille des Jeunes Naturalistes,' Quatrième Série, No. 429, p. 149, 1<sup>er</sup> Juillet, 1906.

† Cf. 'Entomologist,' vol. xlv. pp. 87-89, 1913.



acquaintance with it, however; due possibly to my being seldom able to collect hereabouts at the normal time of appearance. Mr. L. E. Dunster, therefore, has been kind enough to communicate to me his experiences of the Brown Hairstreak in the West Wycombe district, and I cannot do better than quote them. "My locality," he says, "is the only locality I know of in Bucks. My first record is September 11th, 1910, when I took a female about 4 o'clock in the afternoon, flying low over some stunted sloe bushes. I thought she was seeking a suitable place for depositing ova, and made a good search without success. I took another female on September 3rd, 1911. . . . On September 8th, 1912, I was collecting in this locality with a friend, and we saw several *Z. betulæ*. They were flying high over the tops of the sloe bushes, and we were not successful in taking any. I visited the locality again at the latter end of May, 1913, hoping to get the larvæ, but was not able to find any; neither did I see the perfect insect in August and September. . . . Last year (1914), though I spent many days there, . . . I did not see anything of this species." Mr. Peachell reported it from the neighbourhood of High Wycombe in 1900.

16. *Thecla w-album*, Knoch. Reported (*in litt.*) by Mr. Peachell from the High Wycombe district; but I have no precise information of locality or time of appearance. Seems to be seasonally common in the southern part of the county. There is also a somewhat vague record in Newman's 'British Butterflies': "In gardens (William Walker)."

#### LEMONIIDÆ.

17. *Hamearis lucina*, L. This is another butterfly which, for many years apparently, I overlooked in this part of the Chilterns. I came across it quite unexpectedly last year at the edge of a beech wood, where there was also plenty of cowslip growing in the near neighbourhood, and as there are many localities where the food-plant grows all along the hills, I daresay it will prove to be not uncommon. Judging from a number of pupæ sent me eleven and twelve years ago by Mr. Goodson, of Tring (Herts), it is plentiful in that district. It is recorded also from Drayton-Beauchamp and Aston Clinton (Harpur Crewe); and from Halton by Mr. N. C. Rothschild. Mr. Peachell (1900) says that he had never taken it in the High Wycombe district, and Mr. Spiller that he can claim but a single example for the Bucks. hills. On the other hand, the late Mr. G. C. Barrett (Victoria County History List) describes it as "plentiful near High Wycombe."

Earliest seen, May 22nd, 1914, when the males were already wasted; but a week later they were quite fresh in a wood on the borders of Northamptonshire.

## PIERIDÆ.

18. *Pieris brassicæ*, L. Common on the warm hillsides, and in the second emergence sometimes occurs in vast numbers, as in August, 1909. There is, no doubt, a partial third brood in favourable seasons, as in 1897.

Earliest seen, *gen. vern.*, April 13th, 1914; *gen. æst.*, July 8th, 1899; *gen. autumn.*, October 30th, 1897, somewhere in the neighbourhood of Great Missenden.

19. *P. rapæ*, L. Common.

Earliest date observed, *gen. vern.*, April 8th, 1908; *gen. æst.*, *aut autumn.*, latest seen, October 9th, 1913.

20. *P. napi*, L. Commoner, as a rule, than either of the preceding; at the outskirts of the woods, and in lanes.

Earliest date observed, *gen. vern.*, May 1st, 1900; *gen. æst.*, *ab. napæ*, Esp., August 3rd, 1899.

[*Pontia daplidice*, L. I know of no Chiltern specimen in collections. Every year, both at the time when the spring migration takes place, and in September, I have visited a certain locality where the wild mignonette (*Reseda lutea*) grows in abundance, and spreads with the lean pastures which at other times have been arable. So far I have not been rewarded.]

21. *Euchloë cardamines*, L. In most seasons abundant, especially in May, 1911. Males often on the open down; the females preferring the hedge-banks where *Sisymbrium alliaria* grows.

Earliest date observed, April 20th, 1912; latest, June 26th, 1897, when it was still quite fresh.

[*Leptosia sinapis*, L. Another butterfly which should be found in woods on the southern incline. Locally abundant in certain woods on the Northamptonshire border, in one of which I found it on June 4th, 1908.]

22. *Colias hyale*, L. I have not yet met with this species on the Bucks. Chilterns, but Professor Cartier reports capture in 1900 in the neighbourhood of High Wycombe, and Mr. Spiller in the Buckinghamshire clover fields towards Bledlow Ridge, also on the west.

[Taken September 13th, 1900, by the Rev. F. A. Walker ('Entomologist,' xxxiii. p. 273) near Chorley Wood, and near Chalfont Road, August 21st, 1901, by Mr. G. B. Oliver (*loc. cit.*, xxxiv. p. 291); both localities rather outside my southern limit.]

23. *C. edusa*, Fabr. I had never seen this butterfly in any profusion before 1913, even in *edusa* years. In August, September, and October of that season it was to be seen in all localities visited by me, the males outnumbering the females by three to one at least. It flew on the hillsides and adjacent clover and lucerne fields from Princes Risborough to Aston Clinton, and westward to the Wycombes.

Earliest date observed, *gen. vern., advena*, May 30th, 1912; *gen. æst.*, August 14th, 1913; and as examples were taken in perfectly fresh condition as late as October 9th, it is probable that a third (or British second) emergence took place.

24. *Gonepteryx rhamni*, L. Usually abundant throughout the range, and, of course, one of the earliest butterflies on the wing in springtime.

Earliest seen. I have not noted it on the Chilterns earlier than April 12th, 1906, as I have not visited the locality in most years at a previous date. *Gen. æst.*, July 22nd, 1908; latest, October 9th, 1913.

(To be continued.)

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## NEW SPECIES OF HETEROCERA FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### *Brabira costimacula*, sp. n.

♂. Head whitish brown, antennæ bipectinated; thorax and abdomen pale brown. Fore wings pale brown, suffused with dusky on terminal area and marked with blackish on the costal area, veins marked with blackish; antemedial line dusky, double, dentate, outer dotted with black on nervures; postmedial line dusky, dentate, excurved, white edged; discoidal spot black; subterminal line white, crenulate; terminal line black, interrupted; fringes pale brown, marked with darker at ends of the veins.

Expanse, 32 millim.

Collection number, 1633A.

A male specimen from Rantaizan, May 6th, 1909. A female specimen, also from Rantaizan (Wileman), in the British Museum is probably referable to this species.

Allied to *B. artemidora*, Oberthur.

### *Acidalia quadrimacula*, sp. n.

♂. Fore wings pale brown, finely flecked with black, and suffused with darker brown on basal and terminal areas; antemedial and medial lines dusky, undulated, indistinct, each with a black dot on it in the cell; postmedial line dusky, excurved, dotted with black towards costa; black dots on the termen, and a black lunule between veins 4 and 6, the latter connected with postmedial line. Hind wings pale brown finely flecked with black, suffused with darker brown on basal and terminal areas; discoidal spot black, conspicuous, terminal dots black. Fringes of all wings pale brown dotted with darker at ends of the veins. Under side whity brown, suffused with blackish on basal area of the fore wings; all the wings have a black discoidal spot and postmedial line, the latter on the fore wings is wavy and sinuous, and on the hind wings bidentate about middle; terminal line black, lunular.

Expanse, 33 millim.

Collection number, 1690.

One male specimen from Arizan, August 25th, 1908.

Allied to *A. extimaria*, Walk.

*Acidalia limbata*, sp. n.

♀. Fore wings white, powdered with pale brown; antemedial and medial lines pale brown, the first nearly straight and the second indented before dorsum; postmedial line blackish, undulated, wavy towards costa; area beyond postmedial line clouded with pale brown; discoidal dot and terminal lunules black. Hind wings whitish powdered with pale brown, and clouded with brown on terminal area; antemedial and postmedial lines pale brown, the former diffuse, the latter wavy and indented before middle. Fringes of all wings whitish. Under side whitish; fore wings yellowish tinged and suffused with dusky on the disc; all the wings have a black discoidal dot and blackish undulated postmedial line.

Expanse, 20 millim.

Collection number, 890.

A female specimen from Kanshirei, April 22nd, 1906.

There is a female, also from Kanshirei (Wileman), in the British Museum.

Near *A. fluidaria*, Swinhoe.

*Ptychopoda indigata*, sp. n.

♀. Fore wings whitish, dusted with pale brown; three transverse dusky lines, the inner two parallel, and the outer somewhat wavy and excurved. Hind wings whitish, dusted with pale brown, two transverse dusky lines corresponding with the second and third of fore wings. Under side whitish, transverse marking as on fore wings faintly traceable.

Expanse, 22 millim.

Collection number, 894A.

A female specimen from Rantaizan, May 4th, 1909.

Allied to *P. aspilataria*, Walk.

*Ptychopoda limbaria*, sp. n.

♂. Head and collar pinkish-brown, thorax and abdomen pale buff, the latter marked with pinkish-brown. Fore wings pale buff, finely sprinkled with pinkish-brown; costa, except at apex, pinkish-brown; discoidal dot and traces of antemedial and postmedial lines pinkish-brown; terminal border pinkish-brown, rayed inwardly, tapering towards apex; fringes pinkish-brown, dotted with pale buff at the base. Hind wings pale buff, medial line pinkish-brown, sinuous, slender; terminal border and fringes pinkish-brown, the fringes pale buff at the base. Under side pale buff, tinged with pinkish-brown on margins of all the wings; transverse lines of upper side faintly indicated.

♀. Similar to the male, but the transverse markings are purplish, and on the fore wings there are traces of a double postmedial



line, and a distinct fine and sinuous subterminal line ; the inner edge of terminal border is not rayed.

Expanse, 22 millim.

Collection number, S93.

The male described was taken at Kanshirei May 31st, 1908, and is in my collection ; the female type, which is also from Kanshirei (Wileman), is in the British Museum.

*Ptychopoda rantaizanensis*, sp. n.

♂. Antennæ bipectinated ; head bone-white, collar brown ; thorax and base of abdomen bone-white, rest of abdomen brownish (perhaps discoloured). Fore wings bone-white, costa ochreous-brown finely sprinkled with dark brown ; antemedial line pale brown, indented before dorsum, commencing in a brown spot on the costa ; discoidal dot black ; postmedial line brown, outwardly oblique at costa, where it originates in a brown spot, inwardly oblique from vein 2 to dorsum, obsolescent between veins 2 and 6 ; subterminal line pale brown, dotted with black, irregular, only distinct below the costa and before dorsum. Hind wings bone-white, discoidal dot black ; antemedial line brown, indistinct ; terminal line of all wings black, fringes brown. Under side bone-white, rather glossy, markings of upper side only faintly in evidence.

Expanse, 28 millim.

Collection number, 1808.

A male specimen from Rantaizan, May 14th, 1909.

Very near *P. ferrilineata*, Moore.

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## NOTES ON THE SUCCESSFUL BREEDING OF *PAPILIO MACHAON*.

BY B. PRITCHARD.

As I have been fortunate enough for the past three successive years to breed a very fine series of this lordly insect, in a locality far from its native haunts, perhaps a few notes as to my methods would not come amiss at this slack time of the year ; at least to the younger brigade of entomologists, which we all hope is increasing in strength.

The first year, from paired imagines, I was successful in rearing about seventy larvæ from the egg, the year following about thirty only, but as the third attempt (last year) yielded about one hundred and ninety, I will select it for the one describing my *modus operandi*.

First, the breeding cage is built against a wall facing nearly due south, and is six feet long, four feet broad, and about seven feet high to the apex of roof, the whole being raised from the ground about three feet nine inches, that being a convenient height for purposes of attention, observation, &c.

The autumn of 1913 I obtained a few dozen chrysalids of *machaon* from various sources, including Cambridge fen-collected wild ones, and a good supply from the Continent, placing them in the breeding cage, fully exposed to the winter frosts, but protected as far as possible from predatory lice, earwigs and other small game having a penchant for succulent pupæ.

The second week of February, 1914, I planted a dozen good carrots in six-inch pots in order to provide a supply of luxuriant foliage at time of emergence of the butterflies, as I have found that they oviposit very freely on this easily obtained food-plant.

The butterflies commenced to emerge about the second week in May, and continued doing so at intervals for nearly a month: meanwhile, I had also prepared a good supply of honey-yielding flowers, such as hyacinths, narcissi, wall-flowers, &c., grown in pots and boxes, and I also hung sponges in small pieces soaked with honey, in different parts of the cage.

The weather was rather cold and sunless at first, and the imagines which ventured out first were quite dormant, and appeared starved; however, a few days' hot sunshine made a marvellous difference, and one fine morning on going to visit them I was pleased to see that a very handsome couple had paired, and others were coquetting and sportively flying amongst the flowers and food-plants which I had arranged to fill up the whole of the floor. As days passed other pairings took place, two that I noted, though probably there may have been others, as the ova, laid indiscriminately on upper and under sides, and edges of foliage, began to appear in very considerable quantities.

There were observable differences in size, one batch being distinctly larger, and of a much darker green, than the rest, the hues varying from that colour to pale lemon. It was quite easy and interesting to examine them at this stage with a powerful hand-lens, by simply removing one of the pots of carrots for the purpose. On about the fifth day after having been laid, the egg assumes a darker colour, and continues so doing to the point of hatching, when it becomes a very deep purplish-black with a definite bloom on it. On examination through the lens the shell appears perfectly transparent, and the young larva can be distinctly seen wriggling about, quite ready to eat its way out, and I watched the actual process many times. On complete emergence the young larvæ generally crawled an inch or two away from the shell, returning in about two hours to demolish the remnants of the empty shell as the first solid meal. They soon commenced to crawl over the foliage, and fed for about five days before laying up for the first moult.

As the butterflies kept emerging I watched carefully for ova, but on a strict examination of all the carrot plants I was really astonished at the large number, which could not have totalled

much less than two hundred over all the layings. As the larvæ grew and matured, no small difficulty was created in maintaining a sufficiency of food for such a voracious crew, and I had to adopt special expedients. There was a large bed of carrots in the garden exclusively provided for their benefit, and in due course the half-fed larvæ were transferred to it, being kept from straying by the medium of rough oblong frames covered with lino. Under these shelters the larvæ thrived apace, and it was truly a superb sight to see a host of these handsome creatures—some over two inches long—feeding for all they were worth. One admiring friend said they put him in mind of a troop of “Zebras,” apparently a far-fetched simile; but the allusion was quite understandable, the association of ideas being inspired by the endless array of stripes, which first struck on one’s vision. There was a perfume arising from the cages, so intense and unequivocal that everyone remarked on the “strong smell of pears”; and there it assuredly was. From this batch of larvæ, all but about six spun up, some on the foliage, others on the sides of the cages, and it was curious that the numbers of grey and green chrysalids were pretty equal, it being perfectly hopeless, however, to try to discover any outward reason for the difference, nor from observation after emergence was it possible to say there was either a sex or colour identification.

Greatly to my mortification the whole of the pupæ very rapidly showed signs of the imago within, and all the butterflies came out, so I had either to kill for the cabinet, or free them, for circumstances prevented my preparing for a second brood.

Another season, for winter stock it might be advisable to place a supply of chrysalids in a refrigerator in order to retard them till all chance of emergence has gone. I therefore let about fifty go, in the hope that they would establish themselves somewhere in the vicinity, and obtained a fine series to replenish the cabinets, with heaps of spare specimens for friends.

The whole series showed little variation from the normal, excepting that of size, which ranged from an expanse of  $3\frac{3}{4}$  in. to a little under 2 in., and the intensity of blue in the hind margin, which from a dense blue-black varied to a most delicious brilliant sky-blue; the red anal spot also differs from blood-red to a dirty brick colour.

*Machaon* is certainly easy to breed under proper and favourable climatic conditions, and there ought to be no serious difficulty in naturalising this species in Shropshire, as the county contains many suitable localities where the ordinary food-plants, *Peucedanum palustre* or *Daucus carota*, are plentiful. I should welcome collaboration from any Shropshire entomologists in this coming season to endeavour to establish it.

“Headingley,” Shrewsbury: December 14th, 1914.

# NOTES ON FORCING *CROCALLIS ELINGUARIA*, AND AN ATTEMPT TO HYBRIDISE WITH *ODONTO- PERA BIDENTATA*.

BY W. BOWATER, Lieut. R.A.M.C.T., F.E.S.

IN February, 1913, I received a batch of about one hundred ova laid by a wild female *Crocallis elinguaris*. They were kept in a bacteriological incubator at 68° F. A few hatched each day from March 3rd-16th inclusive, all proving fertile. About sixty of the larvæ were kept in the incubator, and were fed on *Prunus pissardi*, and later on hawthorn. They varied very much in rate of growth.

On March 31st the first pupated, three on April 1st, and a few daily till April 17th. The temperature in the incubator varied from 66° F.-78° F.; almost all light was excluded, but the air was moisture-laden, and there was some ventilation. Inside measurement, 12" × 10" × 9".

Glass-topped metal boxes were used to contain the larvæ for about the first half of their existence, then an ordinary breeding cage.

The rest of the larvæ (about thirty) were kept after hatching in a room with temperature varying from 45° F.-60° F. The last of these pupated May 3rd. In all about fifteen larvæ died.

The pupæ were kept in the incubator till May 17th, and were then taken to Rhyl, and kept in a warm room. A male emerged on May 20th at 5 p.m. Tried with two female *Odontopera bidentata*, but did not pair. A female emerged on 22nd, and was tried with males of *bidentata*, without result.

On 28th two females and on 29th one female *elinguaris* emerged, and were put with four male *bidentata* type. One couple paired at 10 p.m. on 29th, and were still *in cop.* at midnight. They had separated at 7 a.m. next day.

No ova were deposited till June 6th. The female died on the 10th, having laid twenty-five ova, infertile.

Less than 5 per cent. of the *elinguaris* were crippled; most were full sized, and all were practically normal in colour. They paired freely *inter se*, and deposited over one thousand ova.

I hope some day to repeat the experiment, but trust some one else will try this year. The chief difficulty is to retard the emergence of the *bidentata* pupæ, as low temperatures often fail to do this.

I am much indebted to Mr. J. W. H. Harrison for advice on this matter.

Moseley, Birmingham : February 20th, 1915.



## NOTES AND OBSERVATIONS.

MELLINIA (XANTHIA) OCELLARIS.—I was much interested both in Mr. Jones's and Mr. Worsley-Wood's notes on this species (*antea*, pp. 43 and 63). Mr. Jones's capture was undoubtedly a very good one, but certainly far from a record. A friend and myself on September 13th, 1911, captured thirty-eight specimens in one of the Thames Valley localities, and might have taken several more had we wished to do so. Mr. Worsley-Wood asks if *M. gilvago* has at any time in any shape been found associated with poplar. Many years ago I took here a specimen of *M. ocellaris* at sugar. In April, 1908, I was struck with the large number of catkins lying on the ground beneath a row of black poplars, which line the drive to my house. My thoughts reverted to the *M. ocellaris* previously taken, and I swept up about a peck of catkins, which I placed, just as they were, in a box. Night after night I inspected the box in the hopes of seeing a larva crawling about, but fruitlessly. After a month of this, the catkins being in a mouldy and semi-rotten condition, I turned them out to throw them away, when, catching sight of a larva at the bottom, I had a good search, and found nine in all. Of course I was sure they were *M. ocellaris*, and I took the greatest care of them, feeding them on poplar leaves (hitherto they had fed solely on the dead and mouldy catkins), and pupating them successfully. In September following I bred from these five *M. gilvago* and two *M. cerago*, but, needless to say, no *M. ocellaris*!—PERCY C. REID; Feering Bury, Kelvedon, March 7th.

THE LYMAN COLLECTION OF LEPIDOPTERA.—We understand that the collection of Lepidoptera formed by the late Major Henry Herbert Lyman, of Montreal, stated to be one of the finest in Canada, has been bequeathed, together with his library, to the MacGill University. An ample endowment fund has also been provided to defray expenses of upkeep, &c. The collection will be accessible to all students of entomology.

It may be remembered that Major Lyman lost his life in the awful disaster that befel the Canadian Pacific steamship 'Empress of Ireland' in the St. Lawrence river on May 29th, 1914.

BRITISH SIPHONAPTERA. — In the 'Entomologists' Monthly Magazine' for March last (vol. li. [3rd series, vol. i.], pp. 49–112), an article is published on the fleas known to occur in the British Islands. It is entitled "A Synopsis of the British Siphonaptera," and is by the well-known authority on this group of insects, the Hon. N. Charles Rothschild. Altogether some forty-five species, in sixteen genera, are dealt with. These are classified under two Suborders—Integricipita and Fracticipita. In the former there are two Families and four Subfamilies, and in the latter three Families.

Ninety-six drawings of structural details, by Dr. Jordan, are admirably reproduced on the eight plates issued with the Synopsis.

A FEW NOTES ON LEPIDOPTERA, CHIEFLY BUTTERFLIES, DURING 1914.—The spring, hereabouts, was characterized by some very warm weather at the end of April: another quite summer-like spell, about

May 20th, was succeeded by bitter winds later in the month, so that in many spots the prematurely-forced shoots of oak, ash, bracken, and even bramble, were blackened and withered. The effects of this wintry return after really hot weather were specially noticeable on a visit to Holmbury Hill, Surrey, on June 13th, when whole acres of the whortleberry that clothes the hillside were seared and brown, where the exposure was greatest. Butterflies were fairly abundant in this poorly represented district of Kent. A very noticeable feature in the spring of 1914 and for the last few seasons has been the absence or scarcity of larvæ of the genus *Hybernia* and those of *Cheimatobia brumata* and *Oporabia dilutaria*, the expanding oak leaves being almost untouched, and, it may be added, the beauty of the woodlands being very much enhanced thereby. The natural result was a scarcity of the resulting imagines in the autumn and winter, during which I only saw a few males of *H. aurantiaria*, and none of *H. defoliaria*. Eight years or so ago the spring oak-shoots were regularly denuded by the above and some other species, and on any mild day in autumn or winter specimens of the males could be taken at rest in the greatest profusion on the fences and tree trunks close at hand. These discrepancies in numbers of such common species seem specially worth recording, being the result of purely natural conditions, neither "over-collecting" nor any other artificial interference with the insects themselves, or with their localities, being conceivably responsible for them. The following notes on butterflies refer, when not otherwise mentioned, to the sandy wooded uplands in the neighbourhood of Brasted Chart, or to the parallel range of chalk hills (the North Downs) about two miles further north:—

*Pieris brassicæ*.—First appearance, April 21st, North Downs; the first brood was in fair numbers, but the second far more abundant. I record a specimen as late as September 25th. *P. napi*.—From April 21st. *P. rapæ*.—April 19th; both broods plentiful. Last seen, October 5th.

*Euchloë cardamines*.—Plentiful. First seen at Reigate, April 26th; a male seen here as late as June 12th. As this butterfly is not usually associated with the cultivated Cruciferae, it may be of interest to record a female on May 22nd depositing eggs on the immature pods of "swedes" in a neglected field where were some flowering survivors of last year's crop. The resulting larvæ were fed to maturity entirely on the same food-plant as was selected by the parent female. They pupated about June 24th. It was also found that larvæ of this species would feed readily on the young pods of the wild cabbage (*Brassica oleracea*) picked from plants growing close to the sea in Folkestone Warren.

*Colias edusa*.—I have no personal record of this butterfly during 1914.

*Gonepteryx rhamni*.—This butterfly persists in comparative scarcity about here, though the numbers for 1914 were certainly an improvement on the two previous seasons. First appearance (hybernated), March 31st; seen singly afterwards. Ova observed in Mereworth, May 16th. First of the fresh emergence, August 2nd, and more frequently seen in the garden, at the phloxes, &c., subsequently, than in the woods. Last record, September 6th.

*Vanessa urticae*.—Common before and after hybernation. First appearance, March 31st; freshly emerged, June 22nd; last seen, October 10th. In August a specimen had settled up in an outhouse, apparently for hybernation. *V. io*.—Only two hybernated specimens seen here, on April 18th and 20th. I rarely see the larvæ hereabouts, but found a small brood of half-grown ones near Sevenoaks on June 24th; the subsequent butterflies, which began to emerge on July 25th, being released in the garden. Specimens—possibly my released ones—were seen in the garden from August 14th–24th, and one at *Buddleia* flowers in the town of Sevenoaks, August 25th.

*Pyrameis cardui*.—I do not record any hybernated (or migrated) specimens here, but saw a few early in July near Folkestone. Later on the larvæ were common on thistle near by, and one was bred as late as September 6th. The butterflies were by no means plentiful; last seen, September 26th. *P. atalanta*.—Hybernated specimens were not common: one in the garden, June 16th; another, June 24th; and two near Folkestone, July 1st. The first undoubtedly fresh specimen seen, August 10th; common at treacle patches later. Larvæ not very abundant hereabouts. The fine late autumn was very favourable to the butterflies. I record one in Kensington, October 7th; another at 9.15 a.m. on October 26th here (an early hour on a late date for the species to be on the wing); and, finally, a specimen on November 7th.

*Argynnis euphrosyne*.—From May 17th scarcer than usual near here; rather abundant close to Sevenoaks, May 20th. *A. aglaia*.—I never see this species here, nor, except singly, on the chalk downs near by. One wasted female near Oxted, August 11th.

*Epinephele ianira*.—First record, June 13th, North Downs near Dorking; several specimens.

*Cæonympha pamphilus*.—From May 15th.

*Arge galathea*.—July 3rd, one, at Alkham, near Folkestone.

*Aphantopus hyperanthus*.—From June 28th. This species is distributed throughout the woodland, but is never abundant.

*Thecla rubi*.—Several specimens on the North Downs, near Westerham, April 29th, and fairly common subsequently. Last seen, June 13th, near Dorking.

*Chrysophanus phlæas*.—Very scarce in the earlier part of the season here, and even more so on the chalk. First recorded, May 14th. On August 11th and subsequently, common. Last seen on October 8th. On September 15th, a chilly and windy morning, I had the good fortune to "pill-box" a female specimen of the variety *schmidtii* whilst walking to Sevenoaks; the capture being the more remarkable as being the only butterfly of any sort on the wing seen that day.

*Lycæna icarus*.—First seen near Oxted, one male, May 15th. On June 1st in great abundance on the nearer chalk downs. One paired female was found, quite unable to fly, with the wings still limp. Ova laid on May 30th hatched June 15th, and the first larva pupated July 23rd, and emerged August 13th, a male. The majority of the larvæ from the above ova showed signs of hybernating as such at a very early stage, as I have repeatedly found to be the case with this species. A female at rest on a black tarred fence on August 5th



seems worth noting. The butterflies were still flying on September 18th. The second brood was first recorded on July 22nd, and was produced in great abundance. *L. corydon*.—Fairly abundant locally on the North Downs on August 11th; wasted on September 2nd. *L. adonis*.—A worn pair near Folkestone, July 1st, and a male in the same locality, July 7th. I have records of this species in every month, from April to October, both inclusive, in exceptional seasons. *L. agestis*.—I have never seen this species on these hills; it is fairly common, but local, on the North Downs. First record, May 30th. *L. argiolus*.—First seen in Sevenoaks, April 16th; several in Reigate, April 26th; two in Kew Gardens, May 7th. Ovipositing on dogwood, near Westerham Hill, May 19th. The first brood was abundant hereabouts, the second less so. The first record of the latter was on August 1st; larvæ on ivy-buds, August 23rd.

*Hesperia alveolus*.—April 21st and subsequently; fairly common on the North Downs, less so on these hills. Still on the wing, June 13th.

*Thanaos tages*.—From April 29th, North Downs, and very abundant later. (On the above date it may be here worth noting a specimen of *Hypocrita jacobæ* was on the wing—a very early date for this species.) On August 16th a fresh-looking specimen of *T. tages* was seen on the North Downs, presumably of a second brood. Though he has not the exact dates, Mr. Gillett tells me that late summer specimens were observed by him thereabouts in 1911.—R. M. PRIDEAUX; Brasted Chart, Kent, February 10th, 1915.

NOTES ON LEPIDOPTERA ATTRACTED BY LAMPS AT BEXHILL-ON-SEA (concluded from p. 68).—June 5th.—First appearance of *Miana fasciuncula*, *Leucania impura*, *Anaitis plagiata*, and other common things. Also the only *Bapta temerata* I have taken here. 12th.—*Arctia villica*, *Dianthæcia capsicola*. 17th.—*A. villica*, *Boarmia consortaria* (one), *Cerura bifida* (one), *Acidalia marginipunctata*, *Petilimpa arcuosa*, *Noctua primulæ* (very abundant henceforth, as were other common insects, e.g. *Miana strigilis*). 18th.—*Pterostoma palpina*, *Ephyra pendularia*, *Cleora lichenaria*, *Lygris associata*; first *Boarmia repandata*. 19th.—*Eurymene dolabraria*, *P. palpina*, *Pachys betularia* (common). 21st.—*Cybosia mesomella* (one), *A. marginipunctata*, and *A. subsericeata* (one), *Cucullia umbratica*, *D. capsicola*; first *Acidalia imitaria*, which afterwards swarmed at my window. 24th.—*Cidaria fulvata*. 25th.—*Boarmia roboraria* (one). 27th.—*Hylophila prasinana* (caution: turns bright orange in ammonia), *Mesolenca albicillata*, *Cleora lichenaria*, *Thyatira batis*, *Plusia pulchrina*; first appearance of *Nola cucullatella*, *Hemithea strigata*, and *Acidalia dimidiata*, which all swarmed later; also 28th, *Acidalia aversata*. 29th.—*Ellopiopsis prosapiaria*, *Plusia chrysitis* (common after). 30th.—*Arctia villica* (two). (N.B.—*Pericallia syringaria*, flying in garden now, never came to light. A curious exception among "thorns".)

July 6th.—*Habrosyne derasa* (common, but only one *T. batis* taken), *Asthenes sylvata* (testaceous). 13th.—*Palimpsestus fluctuosa*, *Geometra papilionaria*, *Bryophila glandifera*, *Mitochrista miniata* (common), *Lithosia complana* (one), *L. lurideola* (this swarmed, but though I examined scores I only detected one *L. complana*); first



*Porthesia similis*. 14th.—*Palimpsestis octogesima*, *Herminia derivalis*, *Stilpnotia salicis* (the only one), *Malacosoma neustria*, *Eupithecia succenturiata* (I have omitted most of the genus *Eupithecia*, as I do not trust my identifications, and prefer to breed them); first second-brood *S. bilunaria*. 16th.—First *Nudaria mundana* and *C. matura* (both common); second brood of *Cilix glaucata*; appearance of *Ortholitha limitata* (*mensuraria*). 18th.—*Lithosia griseola*, &c., *Ania emarginata* (one). 20th.—*Chærocampa elpenor* (worn). 21st.—*Lymantria monacha*, *Agrotis strigula* (? second brood), *Cleora lichenaria*. 25th.—First *Epione apiciaria*. 27th.—*Agrotis puta*, *Acidalia marginepunctata* (second brood), *Xanthorhoë unangulata*, *Thamnonoma wavararia*, *Lygris associata*.

August 1st.—*Triphæna ianthina*. 7th.—*Bryophila perla* abundant just now. 11th.—*Pterostoma palpina* (second brood). 12th.—*Pheosia dictæoides* (one), *Hepialus sylvina*; second brood of *Noctua plecta* and *H. rubi* appeared. 13th.—*H. sylvina*; first *Crocallis elinguaris*, *P. dictæoides* (two). (Is this species commoner in the second brood? I only took this brood here, and the same thing happened in 1912 when "lamping" on Kingston Hill. In both cases *P. tremula* was commoner as a first brood.) 14th.—First *Ennomos alniaria* (very common later). 20th.—*N. ziczac* (second brood), *Lymantria monacha*, *Ennomos fuscantaria*, *Ligdia adustata*. 22nd.—*E. fuscantaria*.

September 7th.—*Gortyna ochracea*. 8th.—*Epineuronion popularis* (common), *Noctua neglecta*. 18th.—*Thera firmata*, *Epione apiciaria*; first appearance of *Omphaloscelis limosa*, which swarmed henceforth. At this date I began collecting here in 1913, and it is interesting to compare the first appearances of the autumnal species in two such different seasons. *O. lunosa* appeared on the 20th in 1913. 22nd.—*Cidaria miata* appeared and was common to the end of October. 25th.—*Xanthia fulvago*, *Amathes lychnidis* appeared (1913 on the 30th). 27th.—*Xanthia lutea*, *Noctua c-nigrum* (30th in 1913), *Percnoptilota fluviata*.

October 2nd.—*Thera firmata*, *Ortholitha cervinata* (September 26th, 1913). 8th.—*Tholera cespitis* (one, worn), *T. firmata*. 9th.—*Calamia lutosa* (one), *Porthesia similis* (second brood?). 10th.—*Ennomos erosaria* (one). 13th.—*Cidaria siterata* (*psittacata*) (scarce here compared with *C. miata*, but both species very fine and richly coloured); first *Miselia oxyacanthæ* (1913 on the 11th). 14th.—First *Diloba caruleocephala* (1913 on 22nd), and *Himera pennaria* (1913 on 25th). 21st.—*Agriopsis aprilina*, *Cidaria siterata*. 22nd.—*Agriopsis aprilina*, *Thera firmata*. 23rd.—*Chesias spartiata* appeared (1913 on 22nd). 24th.—*Oporabia dilutata* appeared (1913 on 22nd), and *Hybernia defoliaria* (quite scarce here). 25th.—(1913, *P. fluviata*). 26th.—*C. siterata*.

Among other species, for which I have no dates, I may mention *Phalera bucephala*, *Arctia caia*, *Hipocrita jacobææ*, *Acronycta megacephala*, *Noctua triangulum*, *Hydræcia nictitans*, and *H. micacea* (common). *A. exclamationis* is of course a pest, and *Rusina tenebrosa* and *Caradrina morpheus* are common.

A very curious visitor to a suburban lamp was *Hydrelia uncula*. This swams in the marshes two miles away, but one vagrant turned up at light. Probably *C. lutosa* is a wanderer from the same

locality. Some common species are only occasional visitors to light, *e. g.* I have taken solitary specimens of *Amathes lota* and *A. macilentata*, *Eupsilia satellitia*, &c. There is hardly any Geometer that will not turn up occasionally, whereas the Noctuae are very pronounced in their likes and dislikes. *Luperina testacea* swarms at the end of August, as does *Amathes lychnidis* at the end of September, and *Diloba ceruleocephala* at the end of October; *Pacilocampa populi* was very common in November, 1913.

There are many species I have not made a note of because, like the poor, they are always with us, such as *Xanthorhoë fluctuata* and *X. sociata*, *X. montanata* and *Rumia luteolata*; *X. fluctuata* first appeared on April 4th. Also some I omitted to note at the time, *e. g.* one *Eustroma silaceata*, too worn to take. There are also curious omissions on the part of Nature. It is nothing less than providential that *Camptogramma bilineata* is blind to artificial light, otherwise the lamps would have been obscured.

Since writing the above I may add:—

*November 5th.*—*Hybernia aurantiaria*, and first appearance of *P. populi*; also a wasted specimen of *E. apiciaria*. I took this first on July 25th. I doubt if it is a second brood specimen, as some ova I obtained from an early example have not hatched even in the house.—ERNEST A. C. STOWELL; Laleham, Bexhill-on-Sea.

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, November 18th, 1914.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Messrs. Harry George Champion, B.A., c/o U.S. Department of Agriculture, Entomological Bureau, Washington, U.S.A.; J. J. Lister, St. John's College, Cambridge, and Merton House, Grantchester; and Rev. James Waterston, B.D., B.Sc., 22, Blandford Road, Bedford Park, W., were elected Fellows of the Society.—The President announced that the Royal Society had awarded the Darwin Medal to Prof. E. B. Poulton, a former President of the Entomological Society.—Before announcing the nominations of the Council for the next year's officers and council, the Secretary said that the Council desired to put on record their great regret that Dr. Chapman had again declined to be nominated for the Presidency. The council felt that his continued absence from the Presidential chair would be a lasting stigma on the Society, unless it were somehow put on record that it was by his own desire that he did not occupy it. The nominations of the council were as follows:—President, the Hon. N. Charles Rothschild, M.A., F.L.S., F.Z.S.; Treasurer, A. H. Jones; Secretaries: Comm. J. J. Walker, M.A., R.N., F.L.S.; the Rev. George Wheeler, M.A., F.Z.S.; Librarian, G. C. Champion, A.L.S., F.Z.S.; Other Members of Council: G. T. Bethune-Baker, F.L.S., F.Z.S.; E. A. Butler, B.A., B.Sc.; E. A. Cockayne, M.D.; J. E. Collin, F.Z.S.; H. Eltringham, M.A., D.Sc., F.Z.S.; C. J. Gahan, M.A.; E. Ernest Green; G. B. Longstaff, M.A., M.D.; G. Meade-Waldo, M.A.; G. W. Nicholson, M.A., M.D.; H. Rowland-Brown, M.A.; A. E. Tonge.—Mr. E. E.

Green exhibited two specimens of an *Anthrocera* (*Zygana*) from Camberley, taken August 20th, 1914, which appeared to be *A. meliloti*, though South states that "the only part of Britain that the species inhabits is the New Forest, Hampshire." He also exhibited a specimen of the rare Hyphenid *Parasestia fuliginosa* taken at light at Camberley, July 21st, 1914. The President said that he should have named the specimens *meliloti* without hesitation, and Mr. Jones concurred.—Mr. E. B. Ashby, on behalf of Mr. Dickinson, a few butterflies from Hinterzarten in the Black Forest and from Pontresina.—Mr. Prideaux, a cocoon of *Bombyx quercus*, with the dead, shrivelled larva inside, together with the empty puparium of a dipterous parasite, which, with the wings unexpanded, lay beside it, imprisoned within the cocoon of its host.—Mr. Simes, a series of *Agriades thersites*, *Plebeius zephyrus* var. *hesperica*, and *Melitæa desfontainii* from Albarracin taken in the end of May and the beginning of June, this year. The females of *A. thersites* were strongly marked with blue, and amongst the males was a specimen the under side of which had only the discoidal and marginal spots.—The following papers were read: "A Revision of the Mexican and Central American Telephorinæ (Fam. Telephoridae), with Descriptions of New Species," by George Charles Champion, A.L.S., F.Z.S., F.E.S.; "Descriptions of two New Genera and New Species of Mymaridæ from Tasmania," by Chas. O. Waterhouse, I.O.S., F.E.S.

Wednesday, December 2nd.—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Prof. Lameere, of Brussels, was elected to the Honorary Fellowship vacant by the resignation (and subsequent death) of Dr. August Weismann.—The Rev. F. D. Morice exhibited a few Hymenoptera of various groups from Egypt, Algeria, &c., showing the silvery pubescence and pale colours frequently characteristic of Desert insects. Also a lantern slide showing the seventh ventral segment in the male *Prosopis communis*.—Mr. H. J. Turner exhibited a striking aberration of *Argynnis niobe*, with symmetrically coalescent dark markings on the upper side and the silver spots on the under side hind wing forming a triple basal blotch and marginal streaks.—Mr. S. A. Neave exhibited a large series of insects, 1326 in all, forming the prey of a common Asilid, *Promachus fasciatus*.—Mr. W. J. Lucas exhibited a specimen of *Drepanepteryx phalaenoides*, Linn., taken about the end of July, 1914, by Mr. E. A. C. Stowell, B.A., at Bexhill.—Dr. H. Eltringham exhibited a little machine of his own invention consisting of a mechanical stage specially adapted for the microscopical examination of pinned insects.—Prof. Poulton exhibited the flower of an *Acacia*, probably *A. baileyana*, F. v. Muell., together with a female Lycaenid, *Nacaduba biocellata*, Feld., and the pupa-case from which it had emerged; the larva bore the most remarkable resemblance to the yellow fluffy balls of the inflorescence. The likeness, mainly due to the long yellow hairs with which the larva was clothed, was increased by its attitude, the body being rather strongly curved.—Prof. Poulton also read notes on Dr. G. D. H. Carpenter's observation of the epigamic use of its anal brushes by the male *Amauris psytta*, and also Dr. Carpenter's further observations on the Driver Ant, *Dorylus nigricans*.—The following paper was read: "Further Observations on the



Structure of the Scent-organs in certain Brush-bearing Male Butterflies," by H. Eltringham, M.A., D.Sc., F.E.S.—GEORGE WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 14th, 1915.*—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—Dr. Chapman exhibited an *Anthrocera exulans* with six wings, an *A. anthyllidis* with three tarsi on the left mesothoracic leg, and an *A. achilleæ* with symmetrical wing notches. He also showed exotic lattice-work cocoons, probably Syntomid or Lithosiid, and pupal burrows of *Scardia boleti*, showing the trap-door closing the cocoon proper.—Mr. Moore, cases of *Psychidæ* from the Island of Rhodes, cases of *Ceceticus kirbyi* from Antigua, &c.—Mr. R. Adkin, various cocoons of British species of Lepidoptera, and read a paper entitled "Some Pupal Habitations."—Mr. Sich read an extract from the 'Flora of Middlesex,' Trimen & Dyer, 1869, giving an account of a natural history field meeting which took place in 1629 to Hampstead Heath.

*January 28th, 1915.*—The President in the chair.—Annual Meeting.—The balance sheet and the report of the council were read and adopted. The president read his address, dealing with the position and work of the Society during the past year, and with general entomology during the same period. The usual votes of thanks were passed. The following is a list of officers and council for the session 1915-16: President, B. H. Smith, B.A., F.E.S.; Vice-Presidents, A. E. Gibbs, F.L.S., F.Z.S., F.E.S., and A. E. Tonge, F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, A. W. Dods; Curator, W. West (Greenwich); Editor of Proceedings, E. Step, F.L.S.; Hon. Secretaries, Stanley Edwards, F.L.S., F.Z.S., F.E.S., and H. J. Turner, F.E.S.; Council: R. Adkin, F.E.S., S. R. Ashby, F.E.S., J. Platt Barrett, F.E.S., Dr. T. A. Chapman, F.Z.S., F.E.S., B. S. Curwen, W. J. Kaye, F.E.S., D. R. Morford, N. D. Riley, F.E.S., and W. G. Sheldon, F.E.S. Ordinary Meeting.—Mr. Buckstone exhibited a bred series of *Bupalus piniaria* showing much variation; aberrations of *Hipocrita jacobææ*, smoky, streaked with pink, and entirely smoky hind wings; and *Spilosoma menthastri*, which on emergence had a pink flush which was evanescent.—Mr. Edwards, living specimens of *Ephestia kuhniella* with pupæ and cocoons.—Mr. G. T. Porritt, a fine series of ab. *nigrocostata* and ab. *nigrosparsata* of *Abraxas grossulariata*.

*February 11th, 1915.*—Mr. A. E. Gibbs, F.L.S., Vice-President, in the chair.—Messrs. E. J. Bunnett, M.A., of Forest Hill, and Gordon Fryer, of Twickenham, were elected members.—Mr. L. W. Newman communicated a long record of the results of the October pairing of *Pyrameis atalanta*, and of his unsuccessful attempt to keep the fertile females alive through the winter. He felt convinced that we were almost entirely dependent upon immigration for our supply of this species.—Mr. Frohawk said that *P. atalanta* was on the wing all the winter in suitable weather in the Scilly Isles.—Mr. Barrett said that it occurred similarly in Sicily all the winter.—Mr. R. Adkin exhibited photographs, highly magnified, of the silken thread construction of the cocoons of *Saturnia pavonia*, *Anthrocera filipendulæ*, and *Dicranura vinula*.—Mr. Frohawk showed a large



number of lantern slides of birds, and gave an address incorporating his own observations on the Scilly Isles.

*February 25th.*—Mr. B. H. Smith, B.A., F.E.S., President, in the chair. A special exhibition of lantern slides by Messrs. W. West (Ashted), A. E. Tonge, E. J. Bunnett, C. W. Colthrup, and by Mr. Colthrup on behalf of the members of the Nature Photographic Society, including Messrs. Bedford, Salmon, Sanders, Main, Hocking, Tonge, Irving and Stanley Cook.—Mr. Newman, a long series of *Celerio galii* bred from N. Cornwall ova.—Mr. J. Platt Barrett, a series of *Euchloë damone* from Sicily, and remarked on the small amount of variation in the species.—Mr. F. W. Frohawk, a series of yellow forms of *Arctia caia* from the Scilly Isles, where it was met with in some numbers.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*December 21st, 1914.*—Annual Meeting.—The President in the chair.—Messrs. Vincent Fogarty, 56, Bolton Road, Ewood, Blackburn, and William Buckley, 59, Roseneath Road, Urmston, near Manchester, were elected members of the Society.—The usual business of an annual meeting was transacted, and the following members were elected as officers and council of the Society for the ensuing year, *viz.*—President: Prof. R. Newstead, M.Sc., F.R.S.; Vice-Presidents: R. Wilding, J. Cotton, M.R.C.S., &c., J. R. le B. Tomlin, M.A., F.E.S., H. R. Sweeting, M.A.; Hon. Treasurer: J. Cotton; Librarian: F. N. Pierce; Hon. Secretary: Wm. Mansbridge, F.E.S.; Council: L. West, P. F. Tinne, M.A., S. P. Doudney, Wm. Webster, R. S. Bagnall, F.L.S., F.E.S., Chas. Frederick Burne, J. W. Ellis, M.B., Ch.B., F.E.S., Arnold W. Hughes, J. Collins.—The retiring President, Mr. R. Wilding, read his address, in which he reviewed the entomological events of the past year in an able and interesting manner.—Mr. F. N. Pierce exhibited and described the hitherto unrecognised species of Tortricidæ as follows, *viz.* *Cnephasia genitalana*, found in various collections mixed with other species of the genus. Hab. Essex and Kent. *Pæcilochroma pomedaxana*, an apple-feeder, until now considered to be a variety of *P. profundana*. Hab. Devon and Herefordshire. *Lepoptycha æratana*, for some time represented only by a single specimen in his collection, but lately found in Threlfall's series of *Dichrorampha tanacetii*. These have all been distinguished through examination of the genitalia, and full descriptions are published in the 'Entomologist's Monthly Magazine' for January, 1915.—Mr. W. A. Tyerman showed a fine series of *Sphinx ligustri*, most of which had laid over until the second year before emerging; a fine and long series of *Melanippe galiata* from Ainsdale; the ova were deposited in September by a very late female; also from Ainsdale, *Acronycta leporina*, *Cucullia chamomillæ*, and *Chariclea umbra*.—By Mr. Wm. Webster, a large species of *Cicada* from India.—WM. MANSBRIDGE, *Hon. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—*November 4th, 1914.*—Mr. J. E. Cope gave a paper on the "Adephaga." This large and important group was first discussed as a whole, emphasis being laid on the fact that the majority of the terrestrial members at least are more or less useful agents to man, feeding as

they do on many of the smaller injurious creatures such as larvæ, earthworms, mulluses, &c. He then proceeded to take the various families more in detail, mentioning as types the Tiger-beetles (*Cicindelæ*), the Ground-beetles (*Carabidæ*), and the great Water-beetle (*Dytiscus*).—Mr. C. F. Johnson showed *Lepidoptera* taken at Courmayeur, in North Italy, in July, 1914: *M. didyma*, females showing a good deal of variation; *M. parthenie* var. *varia*, *E. melampus*, *E. tyndarus*, *E. lycaon*, *L. pheretes*, *L. hylas*, *L. escheri*, *L. damon*, *Z. carniolea*, *Z. achilleæ*, *Z. scabiosæ*.—Mr. B. G. Crabtree exhibited vars. of *Arctia villica*, with cream tips to the wings.—Mr. V. Coryton brought living larvæ of *U. sambucaria* and a living imago of *H. defoliaria*.—Mr. L. Nathan showed *P. atalanta* and *P. cardui* from Kersall, October, 1914.

*December 2nd.*—Mr. J. H. Watson showed preserved specimens of the life-histories of the common house-fly, the blow-fly, and the gnat. These preparations were by Messrs. Flatters & Garnet.—Mr. B. H. Crabtree showed, for Mr. R. Tait, jun., *Cidaria russata* from South Devon, with vars. He also exhibited *Abraxus grossulariata*, bred from York this year from wild larvæ, var. *nigro-sparsata*, and one remarkable specimen asymmetrical in the hind wings.—Mr. Mansbridge had examples of the same species, var. *lacticolor*, bred from wild larvæ taken at Huyton, near Liverpool.—Mr. J. E. Cope exhibited living specimens of *Ptinus tectus*, found in dog-biscuits.—Mr. F. N. Pierce showed beautiful series of the genus *Sciaphila* of the Tortrices, mostly taken from the Tutt collection.—Mr. L. H. Suggitt gave a very interesting paper entitled "The Evolution of Insects." As an introduction he mentioned the relationship which exists between *P. icarus* and *P. artaxerxes*. He gave further illustrations from the various geological formations, noting that the earliest known type of an insect was found in the Silurian epoch. The evidence of embryology is also of great interest in this regard, inasmuch as by its aid we are able, to a certain extent, to trace the rise of any given species from earlier forms.

*LONDON NATURAL HISTORY SOCIETY.—November 8th, 1914.*—Dr. E. A. Cockayne exhibited four extreme suffused forms of *Rumicia phleas* from Japan, much darker than any English specimens; Mr. W. E. King, *Aricia medon* from Wendover, including an immense female, obsolete under sides, and one partly striated, also *Zizera minima* from Horsley, including abs. *obsoleta* and *extrema*.—Mr. H. B. Williams, four *Aricia medon* showing obsolescence in the under side spotting, a striate under side of *Agriades thetis*, five specimens of *Cænonympha pamphilus* ab. *pallida*, Tutt, from Herts; *Rumicia phleas* ab. *infra-radiata*, Tutt, two ab. *raviata*, Tutt, ab. *obsoleta*, Tutt, and an ab. *cæruleopunctata*, Staud., with pallid patches on the fore wings, from Wimbledon, also a male of the same species from Herts, with left fore wing almost entirely white.—Mr. L. A. E. Sabine a store-box of Noctuæ from Co. Sligo, 1914, including a remarkably fine series of *Agrotis tritici* and a fine form of *Epunda lichenea*.—Mr. A. W. Mera, comparative series of *B. repandata* illustrating the marked darkening that has taken place in the general facies of this species in the London district during the last thirty years.

December 1st, 1914.—Mr. A. W. Mera exhibited a mixed gynandromorph of *Saturnia carpini*, right side predominantly male but with large female patches, antennæ intermediate, a regularly halved gynandromorph of *Boarmia repandata*, left side female, right male. Mr. V. E. Shaw, an *Amorpha populi* bred June 10th, 1909, left side male, right female, antennæ, genitalia and wing markings, the line of division along the centre of the body being clearly defined.—Dr. E. A. Cockayne, *Polyommatus icarus*, a symmetrical gynandromorph with upper side predominantly male, under side predominantly female; another of the same species predominantly female, but with streaks of male colour on right fore wing and both hind wings. Androconia were numerous on the male areas and the genitalia externally purely male. Four gynandromorphous *A. populi*, all showing mixture of male and female parts in their external genitalia, three were predominantly female in their internal organs, having ovaries but no testes, the other was predominantly male. A *Smerinthus* hybr. *hybridus*, male. Two gynandromorphous *Anthrocera hippocrepidis* (doubtful), a heterochroic gynandromorph of *Hemerophila abruptaria*, right side male, ab. *fuscata*, left side female, typical. A heterochroic gynandromorph of *Abraxas ulmata*, right side male, ab. *pantarioides*, left side female, typical. Thirty-seven gynandromorphous *Agriades coridon* with one side smaller than the other, and hairy blue scales and androconia on the smaller side. One with blue scales and androconia on both sides, two with streaks female colour. Also drawings of dissections of gynandromorphous lepidoptera of various species.—Mr. H. B. Williams, a regularly halved gynandromorph of *Fidonia piniaria*, left side female, right male; a female *Ematurga atomaria* with wing coloration of the male; a female *Euchloë cardamines* with a splash of male colour on the under side of left fore wing; a regularly halved gynandromorph of *Amorpha populi*, left side female, right male; a mixed gynandromorph of the same species, left wing and antenna female, right antenna and (apparently) wing intermediate, body apparently male. Also specimens of *Agriades coridon* abs. *inæqualis*, Tutt, and *roystenensis*.—Dr. Cockayne delivered an instructive and interesting address on "Gynandromorphism."—Mr. L. Prout, series of *Cidaria truncata* and *C. immanata* from a Scotch locality, showing considerable variation.

December 15th, 1914.—Mr. L. B. Prout, a short series of *Melanthia bicolorata* bred from Forres ova, showing an interesting modification of the *plumbata* form of variation, the fore wing being largely infuscated, but with parts, in particular a broad subterminal line, remaining white, while the hind wing showed infuscation in the terminal region only. The following officers were elected for 1915:—President: Dr. E. A. Cockayne, M.A., M.D., F.E.S.; Vice-Presidents: Mr. A. Bacot, Rev. C. R. N. Burrows, Dr. T. A. Chapman, Messrs. M. Greenwood, F. J. Hanbury, A. W. Mera, L. B. Prout, R. W. Robbins; Trustees: Messrs. A. W. Mera, C. S. Nicholson, L. B. Prout; Librarians: Messrs. W. E. Glegg and A. L. Mera; Curators: Messrs. S. Austin, C. S. Nicholson, A. J. Wellsdon; President of Research Section: Mr. E. B. Bishop; Treasurer: Mr. F. G. Dell; Secretaries: Messrs. J. Ross and H. B. Williams; Council: Messrs. F. B. Cross, L. B. Hall, L. W. Newman, H. E. Stevenson, H. Worsley Wood.







1



2

Upper side, ♀.

Under side, ♀.

About half natural size ( $\frac{3}{8}$ ).



3



4

Fig. 1. *Elymnias smithi*, sp. n. Fig. 2. *Elymnias smithi*, sp. n.

Fig. 3. *Pyrameis atalanta*, ab. Fig. 4. *Smerinthus hybridus* (gynandromorph)

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## SOME UNDESCRIBED BORNEAN NYMPHALIDÆ.

By J. C. MOULTON, F.E.S.

Curator of the Sarawak Museum.

(PLATE VI., FIGS. 1 & 2.)

In preparing a key to the butterflies of Borneo it became apparent that a few forms needed description. As the completion of my work has to be postponed indefinitely, it is, perhaps, useful to publish these few descriptions without further delay. The types are at present in the Sarawak Museum; they will be deposited in the British Museum in due course, as has been done with other types formerly in the possession of the Sarawak Museum.

### Subfam. DANAINÆ.

*Danaida limniace*, Cr., *kuchingana*, subsp. nov.

Shelford records both *septentrionis* and *microsticta* from Borneo, the latter, I think, based on one female in the Sarawak Museum, which should be referred to *limniace*, hitherto unrecorded from Borneo.

Typical *limniace* comes from the Himalayas, China, Hong-Kong, and Formosa. A lighter form from Ceylon and South India has been named *mutina* by Fruhstorfer. The single Bornean female before me differs from this last subspecies in the following points: hyaline streak from base of cell in fore wing larger, hyaline patch below cell divided and a circular spot cut off distally. In the hind wing the cell is divided by prominent cell-streak nearly reaching the base of wing; the white lines bordering the median and submedian nervures are as long as the next pair which border the submedian and internal nervures. Beneath (including abdomen) the general colour is dull-golden olive, the discal region of the fore wing browner.

Exp. al. 90 mm.

I name this subspecies *kuchingana*, as the only known specimen bears the label "Kuching (Sarawak) December 23rd, 1895."

### Subfam. SATYRINÆ.

*Mycalesis amœna*, Druce, *rampaiana*, subsp. nov.

*M. amœna* was described from Sarawak. This was verified for me by Mr. N. D. Riley, who kindly examined the type in the

British Museum. Fruhstorfer, in Seitz's 'Macro-Lepidoptera of the World,' vol. ix. p. 341. notes it in his collection from North Borneo only, and figures a typical Kinabalu under side. A short series from Kinabalu, collected in September, 1913, shows several points of difference on comparison with the Sarawak series; so that it becomes necessary to restrict typical *amœna* for Sarawak specimens, and separate those from Kinabalu as a distinct subspecies, which I name *M. amœna rampaiana*, subsp. nov., and describe as follows:—

Upper side of both sexes differs from typical *amœna* in the heavier fuscous apical shading; in the male this hides the apical ocelli which are visible in *amœna*.

General colouring below dark fuscous-brown instead of reddish-brown; one broad median band across both wings, which is darker on the margins, lighter in the centre. In typical *amœna* this band is divided into two narrow reddish-brown bands separated by a broader band of ground-colour; in fore wing of male *amœna* the basal band is obsolete.

The tuft of hairs on the costal margin of the hind wing above in the male is greyish-ochreous, not conspicuous; in typical *amœna* this is pale yellow, and at once seen on raising the fore wing.

#### Subfam. ELYMNIINÆ.

*Elymnias smithi*, sp. nov. (Plate VI., figs. 1 and 2.)

Female.—*Under side*: A rough mimic of female *Euploea dio-cletianus lowi*.

*Fore wing*: Brown-fuscous, a rusty brown tinge on inner-marginal area; three large confluent internervular white spots obliquely placed beyond cell, the lowest beyond the third median nervule but not reaching the second median nervule. Some white scales about the centre of costa. *Hind wing*: More rusty-brown than in fore wing, especially in the post-discal and apical region; a white patch in lower corner of cell, slightly extending beyond cell below but not above the radial nervure, and spreading more below median nervure from base of second and third median nervules to the submedian nervure. Cilia white.

*Under side*: Mottled fuscous relieved by white distal patch in fore wing and white discal patch in hind wing. A submarginal row (on the hind wing only) of five small black internervular spots inwardly touched with white scales.

The hind margin of the fore wing is conspicuously scalloped as in *E. nesæa*; the largest tooth-like projection between third and second median nervules. The hind wing also scalloped; prominent tail formed by prolongation of third median nervule.

Exp. al. 77 mm.

Type and only known specimen collected by Professor Harrison W. Smith on or near Mt. Molu, Sarawak, in 1912.

As the male is unknown, it is impossible to assign any definite place for this species in the genus *Elymnias*. But for the fact of its being a Euploëine mimic instead of Danaine, I

should have placed it near *hypermnestra* and *caudata*. On coloration alone I place it provisionally near *hicetina*, which it resembles roughly. The tailed hind wing, of course, separates it from this Celebes species, and the white patch on the hind wing is nearer the base in *smithi*. In *hicetina* it is clear of the cell. The distal white marks of the fore wing are about half the size of those in *hicetina*.

#### Subfam. AMATHUSIINÆ.

*Faunis stomphax*, Westw., *barrauti*, subsp. nov.

Differs from typical *stomphax* in lacking the white band across the apex of fore wing below. A thin dark brown line replaces it in *barrauti*.

*Habitat*.—North Borneo (Mt. Kinabalu, Marapok Mts., and Limbang). Further west and south it is replaced by typical *stomphax*, which Fruhstorfer states also occurs in the Kinabalu district. All the individuals collected on my recent expedition there are referable to *barrauti*, as also specimens from Northern Sarawak (Marapok Mts. and Limbang); the only typical *stomphax* before me comes from Western Sarawak.

Named in honour of the Hon. E. H. Barraut, Resident of the West Coast, British North Borneo, to whom I am much indebted for kind help in facilitating my expedition to Kinabalu.

#### Subfam. NYMPHALINÆ.

*Ducapa fasciata*, Feld., *alleni*, subsp. nov.

Differs from the Continental form figured by Moore ('Lepidoptera Indica,' vol. iv. pl. 363, figs. 3, 3a, 3b, 3c) in the much narrower yellow post-median band on the hind wing above, which is only half as broad (or less) as the succeeding (distally) fuscous band of ground-colour. By this character alone *alleni* in both sexes can be distinguished from all other races, as in these the yellow post-median band is broader than the distal band of fuscous ground-colour.

The yellow spots of the fore wing above are also reduced in both sexes, especially in the female, which differs from the male in having the median yellow band nearly twice as broad.

A local species in Borneo. The Sarawak Museum series comes from Mt. Kinabalu, Baram, Tatau, and Banting. At the last-mentioned locality I obtained it first in 1909. There is a Mission station here in the charge of the Rev. G. Dexter Allen, with whom I stayed on that occasion, and after whom I now name this subspecies.

Fruhstorfer, Bingham, and de Nicéville place this species in the genus *Cirrochroa*, but I prefer to follow Moore and Shelford in giving it full generic distinction.

*Terinos atlita*, Fab., *albonotata*, subsp. nov.

Recorded by Shelford as *teuthras*, Hew., from which it differs, on comparison with Distant's figure of the upper side, in the absence of



fuscous scales at the base of the inner margin in fore wing and in cell of hind wing, in the fuscous scales of the inner margin in hind wing extending to the first median nervule, and in the reduced white distal edging to the two large violet-white subanal spots on the hind wing.

Type and only known specimen (a male) from Simanggang, Sarawak, August, 1900.

The colouring above is very different to that of *fulminans*, with which it agrees, however, on the under side and in the square caudate hind wing.

Fruhstorfer places *T. fulminans* as a subspecies of *atlites*, but in view of the occurrence of another subspecies (described above) in Sarawak, it would appear preferable to give it specific distinction. The under sides of *fulminans* and *albonotata* are exactly similar, but the upper sides are entirely different. Fruhstorfer notes that *fulminans* occurs in both North and South-east Borneo. It is in the Sarawak Museum from Kinabalu, but not from Sarawak. It is, of course, possible that *albonotata* takes its place there, but I consider the upper side is sufficiently different to render this unlikely.

*Apatura parisatis*, Westw., *borneana*, Fruhst.

The female of the Bornean form appears to be undescribed. I have five before me, taken on Mt. Kinabalu in September, 1913, at an altitude of about 3000 ft.

General colouring above tawny ochreous, close to the Ceylon form *camiba*, as figured by Fruhstorfer in Seitz's 'Macro-Lepidoptera of the World,' but lacking the rufous tinge of that form. From the same author's figure of *javana* it differs in the more pronounced row of four black spots in the post-median area of the hind wing above. Beneath, a fifth spot is just visible below the first subcostal nervule. In the fore wing beneath the two apical spots of the submarginal row are white, the next three inwardly edged with black, the sixth large and black, the last also black but smaller.

A sixth female from the same locality, and taken at the same time, differs from the above in the absence of all ochreous colouring, the general colour above and below being grey-brown, banded with white instead of orange. For this I propose the name *balua* (female) form. nov.

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## NOTES ON THE CELL-MAKING OF *MEGACHILE* *LIGNISECA*, KIRBY. [HYMENOPTERA.]

BY ANDREW B. LUVONI.

(PLATE VII.)

WHILST out collecting towards the end of August, 1912, my attention was drawn to several bees of the genus *Megachile* flying round and entering holes in a branch containing several





NEST WITH SIX CELLS OF THE LEAF-CUTTER BEE, *Megachile ligniseca*, IN BRANCH OF OAK.

Photo A. B. Luvoni.

of their nests. On capturing two, and comparing them later with specimens in the British Museum, they proved to be the somewhat rare species *ligniseca*, which I learnt later may be determined with certainty by the habit peculiar to this species of constructing their burrows in solid oak. This branch, which was of oak about 12 ft. long and 8 in. in diameter at its thickest part, had been broken off a tree near by, and had fallen with the thick end resting up in a hedge. The opposite end through resting on the ground had become rotten for about an inch inward, and had been much bored by these insects in former years.

The plate, taken of a specimen now in the British Museum, shows a nest in the solid part of the branch with the surface-wood removed to expose the six cells, except in the vicinity of the entrance in top left-hand corner of plate, this being closed by a plug or wad of circular pieces of leaf placed one on top of the other to a depth of  $2\frac{1}{2}$  in., finishing off flush with the surface of wood and through the outermost pieces of leaf becoming dry and brown requires a very close examination to reveal its existence.

About fifteen tunnels were examined, which, with two exceptions, took various undulatory courses, in one case running parallel with the surface for about half its length, then abruptly turning at an angle of 40 degrees and striking across the wood to within half an inch of the opposite side. The average length was  $6\frac{1}{8}$  in. With the exception of one containing seven, each nest was composed of six cells made up of a number of oblong, almost square-ended pieces of leaf firmly fixed together, and tightly fitting the burrows, the form of which they take. The ends are formed by three or four pieces of leaf cut to the shape of the tunnel, and arranged in the same fashion as those used to stop the entrance of burrow. These pieces are worked on to the ends of the cells in a slightly concave form, the end of each cell fitting into that of its predecessor after the manner of a number of thimbles placed within each other, the whole assuming somewhat the appearance of a large jointed green worm.

Several cells, which I pulled to pieces for the purpose of examination about the end of September, contained full grown larvæ spun up in a smooth brown cocoon, the frass in every case being carefully excluded between the sides and posterior end of the cell and cocoon. These cells varied a good deal in size, all the larger ones being slightly flattened on their sides, thus imparting to them a lozenge or oval shape, measuring 10 mm. by 8 mm. across their ends. The length ranged from 12 mm. to 17 mm., the smaller specimens being quite cylindrical and much more uniform in construction. As far as I could ascertain, the leaves used appeared to belong to a species of elm, but being in such small pieces, and in many cases cut from the centre of the



leaf, rendered it an extremely difficult matter to determine with any certainty. The larva is a stout yellowish-white grub, resembling those of other bees in general appearance. In all the cells opened the larvæ were found resting on their backs in a curved position, with the extremities raised and the head in the direction of the entrance to burrow. Four of the larger cells were removed and placed in a glass-top box on October 10th, a portion being cut away from the side of each to expose the larvæ within. The cells being loose in the box often rolled about on its being moved, thus causing them to take up different positions, but whatever position the cell rested in the larva would always assume the above-mentioned position within a short time. From these observations I presume this is the position most favourable for its development.

The largest larva measured in normal curved position 10 mm., extended 15 mm., and 6 mm. across its widest part. The dimensions of the smallest were: length in curved position 7 mm., width 4 mm.

By observing the larvæ as above described, I had hopes of being able to throw some light on the method of the imagines' emergence; but owing no doubt to the artificial conditions under which it was necessary to keep them, and the difficulty of regulating the supply of moisture, they unfortunately perished about Christmas. Two of these larvæ became infested with numbers of pale grey *Acari*.

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### HOPLOTHRIPS CORTICIS: A PROBLEM IN NOMENCLATURE.

By J. DOUGLAS HOOD, M.A.

(Of the United States Biological Survey, Washington.)

In their 'Histoire Naturelle des Insectes, Hémiptères,' Paris, 1843, Amyot and Serville divide the Tubuliferous Thysanoptera into three genera, *Hoplothrips*, *Haplothrips*, and *Phlæothrips*, the first two being described as new. For the purposes of this paper we are interested only in these two genera, in the interpretation of which there is some disagreement.

*Hoplothrips* is described as having the sides of the head parallel and the anterior femora armed with one tooth on the inner surface, and to it are assigned four species—*H. aculeata*, Fabricius, *H. corticis*, De Geer, *H. flavipes*, Haliday, and *H. statices*, Haliday. *Haplothrips* is said to differ from *Hoplothrips* in that the fore legs are not dentate; and in it is placed only one species, *H. albipennis*, Burmeister.

In deciding the validity and application of these generic names, it is first necessary to select the type-species of each

genus. To *Haplothrips*, as has been noticed, Amyot and Serville assigned only one species, *Haplothrips albipennis*, Burmeister, 1838; and this is consequently the type of the genus (type by monotypy). According to Uzel this insect is identical with *Thrips aculeata*, Fabricius, 1803. The type of *Hoplothrips* was designated by Karny in 1912 as *Hoplothrips corticis*.

In all this the modern students of Thysanoptera are agreed. But in the application of the name *Hoplothrips*, the writer, for nomenclatorial reasons, has been forced to disagree with the conclusions expressed in previous papers on this subject.

In his 'Memoires pour servir à l'Histoire des Insectes,' tome iii. Stockholm, 1773, De Geer describes a *Trips corticis*, which he says is the same as the "*Thrips elytris albidis, corpore nigro, abdominali seta*" of Geoffroy. The name *corticis* is printed in Roman type (the rest of the sentence is in italics), and is included in parenthesis. According to the Entomological Code (Banks and Caudell, 1912), this makes the name truly binomial, for "when an author writes the first Latin word after a generic name in a different type from that of the other Latin words, or puts it in parentheses, such word is the specific name, and the author is considered as having fulfilled the requirements of binomial nomenclature." Three of Linné's species of Thysanoptera, namely, *Trips physapus*, *T. juniperina*, and *T. fasciata*, are diagnosed in the same way by De Geer in this memoir. His contemporaries and successors accepted and employed all names so proposed, almost invariably without question. The Hymenoptera which he describes in the same volume and in the same way are credited to him by Dalla Torre in his monumental 'Catalogus Hymenopterorum'; the names of Orthoptera are accepted by Kirby in his 'Synonymic Catalogue of Orthoptera'; and those of Coleoptera by Gemminger and Harold in their 'Catalogus Coleopterorum.' If De Geer's *Trips corticis* is to be rejected, we must also drop such familiar names as *Necrobia rufipes*, *Hylobius piceus*, and *Harpalus pennsylvanicus* among the beetles; *Ischnoptera pennsylvanica*, *Melanoplus femur-rubrum*, and *Nemobius fasciatus* of Orthoptera; and *Anasa tristis*, the current name of the destructive American squash bug. It is evident that entomologists are agreed that De Geer understood at this time the principles of binomial nomenclature, and adhered properly to them. *The name Trips corticis, De Geer, is thus valid for the purposes of zoological nomenclature.*

Now, having apparently settled the question of the acceptability of this name, it remains to decide to what European species it should be applied. This is a simple matter, for his description is of a Phlœothripid which he found abundantly in June, presumably in the vicinity of Stockholm, under the bark of some old alders, and which, after passing the pupal stage, had become "noire ou d'un brun très-obscur. Les cuisses sont

aussi noires, mais le reste des pattes & les antennes sont d'une couleur pâle & transparente." The pale tibiae and antennae indicate its identity with Uzel's *Trichothrips copiosa*, an hypothesis which is strengthened by a study of his figures on plate i., especially fig. 11, which shows an unarmed, swollen, fore femur, and a strongly toothed tarsus. But final corroboration comes when we read, towards the end of his description: "Voilà donc des *Trips* d'une même espèce, dont les uns sont ailés & les autres entièrement dépourvus d'ailes, mais qui à cela près se ressemblent parfaitement. Différeroient-ils de sexe? C'est sur quoi je n'ai pu encore avoir des éclaircissements." This places the species definitely in the genus *Trichothrips*, Uzel, and absolutely precludes any possibility of its being either *Phlæothrips coriaceus* (Haliday), 1836, or *Acanthothrips nodicornis* (Reuter), 1880. Consulting the distribution of *copiosa* in the literature, we find that it is a common and well-distributed species, having been recorded from Finland, Poland, Hungary, Italy, England, and the United States of America. Its closest European allies (*Thrips ulmi*, Fabricius, 1781; *Phlæothrips pini*, Haliday, 1837; and *Trichothrips affinis*, Reuter, 1899—all of which are now placed in the genus *Trichothrips*, Uzel), in addition to having nearly black tibiae and dark antennae, are, on the other hand, rare or almost unknown species and of restricted distribution. *Trichothrips copiosa*, Uzel, 1895, is thus a synonym of *Trips corticis*, De Geer, 1773.

So far we have discussed only the *Trips corticis*, De Geer, omitting all reference to the insect which Amyot and Serville identified as that species, and referred to their new genus *Hoplothrips*. Their description is of an insect with "les cuisses antérieures épaissies, bidentées." This character makes impossible its reference to De Geer's species, and Karny in 1912 identified it as *Acanthothrips nodicornis* (Reuter); but that species has only one tooth on the fore femur. The insect which they really had before them was doubtless the male of a species of *Hoplandrothrips*, Hood, of which there are now known several European species. Burmeister's *Phlæothrips coriacea* is also a male of *Hoplandrothrips* (at least, in part), an opinion in which Mr. Bagnall concurs (*in litt.*). But whether or not these opinions are correct, we are certain that Amyot and Serville's *Hoplothrips corticis* is a misdetermination and not the proposal of a new name, and is thus without standing in nomenclature.

The case, then, is that of a genus based upon a wrongly determined species. The International Commission on Zoological Nomenclature holds (Opinion 65) that "as a specimen is the type of a species, so a species is type of a genus, and that when an author names a particular species as type of a new genus, it is to be assumed that it has been correctly determined," and that even if subsequent investigation should disclose the fact



that the species before him was erroneously determined, the type of the genus is what he says he had, and not what he actually had. Obviously, this principle obtains also when a subsequent author designates as type of a polybasic genus an originally included, misidentified species. *Karny's designation of "H. corticis" as the type of Hoplothrips must thus be taken to refer to Trips corticis, De Geer, and not to Hoplothrips corticis, Amyot and Serville nec De Geer (= Hoplandrothrips sp.).*

The one matter remaining unsettled is that of the scope of the genus—in other words, the determination of the congeners of the type species *corticis*. It would seem that in the genus *Trichothrips*, Uzel, we really have two distinct groups, generically distinct, the one including such species as *T. pedicularis*, *T. semicæcus*, *T. americanus*, and *T. angusticeps*; the other embracing those species grouping about *T. ulmi*, *T. pini*, *H. corticis* (= *T. copiosus*), *T. karnyi*, and *Dolerothrips flavipes*. The former may be denoted as the genus *Trichothrips*, Uzel, with the type *Phlæothrips pedicularia*, Haliday (hereby designated); the latter may be called *Hoplothrips*, Amyot and Serville, with the type *Trips corticis*, De Geer, designated by Karny, 1912.

The following catalogue lists all the known species belonging in the several genera effected by these changes in nomenclature, those prefixed by an asterisk (\*) being represented in the material before me. Many names will perhaps be missed by various systematists; but these appear to the writer to belong elsewhere. It should be remembered that it is impossible to work satisfactorily from many of the existing descriptions.

#### Genus HOPLOTHRIPS, Amyot and Serville, 1843.

1843. *Hoplothrips*, Amyot and Serville, Hist. nat. d. Ins. Hémipt. p. 640. (Type, *Trips corticis*, De Geer (= *Trichothrips copiosus*, Uzel), designated by Karny, Zool. Ann. Bd. iv. p. 323, 1912.)

1895–1915. *Trichothrips*, auctores, pars.

1910. *Dolerothrips*, Bagnall, Fauna Hawaiiensis, vol. iii. p. 682. (Type, *D. flavipes*, Bagnall, by designation.)

Species: *affinis*, Reuter, 1899, Finland; *angusticeps*, Bagnall, 1910, Hawaii; *barbatus*, Bagnall, 1910, Hawaii; *\*beachi*, Hinds, 1902, U.S.A.; *bicolor*, Bagnall, 1910, Hawaii; *\*corticis*, De Geer, 1773 (nec Amyot and Serville, nec Karny), Europe, U.S.A.; *dubius*, Bagnall, 1910, Hawaii; *\*flavipes*, Bagnall, 1910, Hawaii; *intermedius*, Bagnall, 1910, Hawaii; *japonicus*, Karny, 1913, Japan; *\*karnyi*, Hood, 1914, U.S.A.; *\*karnyi major*, Hood, 1914, U.S.A.; *lanaiensis*, Bagnall, 1910, Hawaii; *oratus*, Bagnall, 1910, Hawaii; *perkinsi*, Bagnall, 1910, Hawaii; *pini*, Haliday, 1837, England; *\*ulmi*, Fabricius, 1781, Europe.



## Genus TRICHOTHRIPS, Uzel, 1895.

1895. *Trichothrips*, Uzel, Monogr. d. Ordn. Thys. p. 246.  
(Type, *Phlæothrips pedicularia*, Haliday, designated in the present paper.)

Species: *aceris*, Karny, 1913, Japan; *\*ambitus*, Hinds, 1902, U.S.A.; *\*americanus*, Hood, 1908, U.S.A.; *\*angusticeps*, Hood, 1908, U.S.A.; *\*anomocerus*, Hood, 1912, U.S.A.; *cæspitis*, Uzel, 1895, Bohemia; *cephalotes*, Karny, 1913, S. America; *dispar*, Karny, 1910, Austria; *\*flavicauda*, Morgan, 1913, U.S.A.; *laticornis*, Bagnall, 1910, Hawaii; *lewisi*, Bagnall, 1914, Japan; *longicornis*, Bagnall, 1913, W. Africa; *longisetis*, Bagnall, 1910, England; *\*longitubus*, Hood, 1908, U.S.A.; *nigricans*, Bagnall, 1910, Hawaii; *papua*, Karny, 1913, New Guinea; *\*pedicularius*, Haliday, 1836, Europe; *propinquus*, Bagnall, 1910, England; *\*semicæcus*, Uzel, 1895, Bohemia, England, U.S.A.; *\*smithi*, Hood, 1909, U.S.A.; *\*zonatus*, Hood, 1914, Panama; *zuluensis*, Trybom, 1912, Zululand.

## Genus HOPLANDROTHRIPS, Hood, 1912.

1839. *Phlæothrips*, Burmeister (nec Haliday), Gen. Ins. vol. i. coloured plate (pages and plates unnumbered).  
1912. *Hoplandrothrips*, Hood (subgen. of *Phlæothrips*), Proc. Ent. Soc. Wash. vol. xiv. No. 3, p. 145. (Type, *Phlæothrips* (*Hoplandrothrips*) *xanthopus*, Hood, by designation.)

Species: *armiger*, Jones, 1912, U.S.A.; *bidens*, Bagnall, 1910, Hungary; *collinsi*, Bagnall, 1914, England; *\*ellisi*, Bagnall, 1914, England; *floridensis*, Watson, 1913, U.S.A.; *\*funebri*, Hood, 1912, U.S.A.; *hoodi*, Bagnall, 1913, German E. Africa; *\*insolens*, Hood, 1912, U.S.A.; *jenei*, Jones, 1912, U.S.A.; *\*juniperinus*, Hood, 1912, U.S.A.; *\*microps*, Hood, 1912, U.S.A.; *natalensis*, Trybom, 1912, Natal; *pergandei*, Hinds, 1902, U.S.A.; *raptor*, Crawford, 1910, Mexico; *\*uzeli*, Hinds, 1902, U.S.A.; *\*xanthopus*, Hood, 1912, U.S.A.

## Genus ACANTHOTHrips, Uzel, 1895.

1895. *Acanthothrips*, Uzel, Monogr. d. Ordn. Thys. p. 259.  
(Type, *Phlæothrips nodicornis*, Reuter, by monotypy.)  
1912. *Hoplothrips*, Karny (nec Amyot and Serville), Zool. Ann. Bd. iv. p. 323. (Key to known species.)

Species: *\*albivittatus*, Hood, 1908, U.S.A.; *doaneii*, Moulton, 1907, U.S.A.; *grandis*, Karny, 1912, Argentina; *\*magnafemoralis*, Hinds, 1902, U.S.A.; *\*nodicornis*, Reuter, 1880 (= *corticis*, Karny, nec De Geer, nec Amyot and Serville), Europe, U.S.A.

## Genus EOTHRIPS, gen. nov.

(ἠώς, dawn, i. e. east; ἔριψ, a wood worm.)

1912. *Dolerothrips*, Karny (nec Bagnall), Marcellia, vol. xi. p. 124. (Type, *Dolerothrips crassicornis*, Karny, hereby designated.)

Species : \**annulicornis*, Karny, 1913, Java ; *armatus*, Karny, 1913, Java ; *connaticornis*, Karny, 1913, Java ; \**crassicornis*, Karny, 1912, Java ; *jasmini*, Karny, 1913, Java ; *laticauda*, Karny, 1912, Java ; *picticornis*, Karny, 1913, Java ; \**trybomi*, Karny, 1913, Java.

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## BEES FROM THE PHILIPPINE ISLANDS.

By T. D. A. COCKERELL.

PROFESSOR C. F. BAKER, of the College of Agriculture at Los Banos (Luzon), is the first to extensively collect the bees of the Philippines ; and the material received from him shows that the islands contain very many species, but very few, if any, endemic genera. When the species are found to be identical with those of other Oriental countries, they usually belong to genera (*Xylocopa*, *Ceratina*, *Megachile*) which nest in wood.

### *Nomioides dapitanellus*, n. sp.

♀. Length about 6 mm., robust, with broad abdomen ; head and thorax yellowish green, with the clypeus (except two black spots), tubercles and upper border of prothorax, scutellum (except a median longitudinal band), and postscutellum (except anterior edge and extreme sides), all yellow (reddened by cyanide in type) ; the scanty hair on head and thorax above pale reddish ; supraclypeal area and sides of front shining, but middle of front wholly dull, appearing blackish ; apical part of mandibles dark red ; scape ferruginous, the apical part black above ; flagellum black ; punctures of mesothorax excessively feeble and minute ; femora black, anterior and middle ones broadly, hind narrowly, red (yellow ?) at end ; anterior and middle tibiæ and tarsi red (yellow ?), the middle tibiæ with a dusky spot behind ; hind tibiæ and basitarsi largely dusky, with much pale reddish hair, which is beautifully plumose ; second joint of hind tarsi broad ; tegulæ hyaline, with a yellow spot ; wings dusky-hyaline, stigma and nervures dilute yellowish brown ; first r. n. meeting second t. c. ; marginal cell truncate at end ; abdomen black (first segment obscure greenish), with broad yellow bands at bases of second to fifth segments, those on second and third with the hind margin concave, the band on fifth occupying most of the segment ; hind margin of fifth segment pallid, subhyaline ; pygidial plate keeled ; venter with much pale reddish hair.

*Hab.* Dapitan, Mindanao (Baker, 3161). The genus is new to the Philippine Islands. *N. dapitanellus* is readily known from *N. obscurus*, Friese, from Java, by the entire yellow abdominal bands. It is known from *N. formosicola*, Strand, from Formosa, by the absence of a yellow band on hind part of mesothorax, as well as other characters. The mesothoracic band also occurs in *N. punjabensis* (Cam.), which Cameron described as a *Ceratina*.

*Coelioxys luzonicus makilingensis*, n. subsp.

♂. Length a little over 8 mm.; differing from *luzonicus* thus: mesothorax anteriorly (but not posteriorly) with a rather large triangle of pure white hair; oblique hair-marks on scutellum larger, pure white; spot above posterior end of tegulæ pure white; first r. n. joining second s. m. very close to basal corner; upper apical teeth of abdomen longer, and not on the same horizontal plane, the inner on each side being higher than the outer, which is not true of *luzonicus*. The hair on the eyes is very short.

*Hab.* Mount Makiling, Luzon (Baker, 2555). Easily known from *C. manilæ*, Ashm., by the absence of a triangular patch of pale hair on posterior margin of mesothorax. The male of *C. philippensis*, Bingh., on the other hand, has not even the anterior patch.

*Coelioxys bakeri*, n. sp.

♂. Length 8.25 mm.; black, with the dorsal markings, due to scale-like pubescence, bright orange-fulvous; region about antennæ with orange-fulvous hair, but that on clypeus and adjacent parts, and under side of head, creamy-white; hair of pleura (except uppermost end) and under side of thorax, also under side of coxæ, dense and white; trochanters black, femora, tibiæ and tarsi ferruginous, the anterior and middle femora largely black beneath; antennæ black; eyes with short brown hair; sides of vertex with scattered, irregularly placed large punctures; mesothorax with large distinctly separated punctures; principal hair-ornaments on thorax above consisting of a dense patch in front of tegulæ, a broad triangle on mesothorax anteriorly (but not posteriorly), a stripe (claviform posteriorly) above tegulæ, a broad band at base of scutellum, partly invading mesothorax, and emitting a median stripe, enlarged at the end, posteriorly (the whole shape like that of a Taube aeroplane), and dense, long, paler hair at sides of metathorax; scutellum simple; axillar teeth moderately long, slightly curved; area of metathorax with fine fluting at extreme base; tegulæ piceous; wings strongly infuscated, paler basally; b. n. meeting t. m.; abdomen well punctured, with narrow entire orange-fulvous hair-bands, the third segment has traces of a second (median) band, while the fourth has a well-developed basal one; hind margins of fourth and fifth segments ferruginous; short spines on lateral margins of fifth and sixth segments; apical armature of six spines, the two lower ones wide apart, slender, those of the upper pairs rather short, the inner of each pair higher than the other; venter with very broad dense hair-bands, slightly stained with fulvous.

♀. Length about 7 mm.; colours and ornaments essentially as in the male, but mandibles, base of legs, and under side of abdomen ferruginous; sides of vertex closely punctured; punctures of mesothorax smaller and much denser; axillar spines not at all curved inward; tegulæ ferruginous; last dorsal segment of abdomen shining, with fine scattered punctures, but apically rugose, very broad, subtruncate; last ventral segment extending a moderate distance beyond last dorsal, broadly truncate, but not so broad as the dorsal; sub-basal punctures of last ventral extremely minute, those of the other ventral segments much larger.



*Hab.* Male (= type), Iligan, Mindanao (Baker, 3150); female, Dapitan, Mindanao (Baker, 3151). It is not improbable that the female represents a distinct race, or closely allied species. The species is readily known from the other Philippine forms by the colour and character of its ornaments. The nearest relative is probably *C. sumatrana*, Enderl., from Soekaranda, Sumatra.

*Coelioxys dapitanensis*, n. sp.

♂. Length a little over 6 mm.; black, with the knees, tarsi, subapical band on mandibles, and tegulae, dull ferruginous, the tarsi more brightly coloured than the other parts; hair of eyes short and brown; face, sides of front, and cheeks with pale fulvous hair; antennae black; sides of vertex dull, with scattered very large shining punctures; mesothorax dull, with large, well-separated shining punctures, sides of disc more or less longitudinally ridged; scutellum sharp-edged, axillar teeth short; extreme base of area of metathorax finely rugose; thoracic ornaments pale fulvous, formed nearly as in *C. bakeri*, but the scutellar band is nearly or quite divided in the middle, and there is no longitudinal stripe behind it; there is also a large bare space in the middle of the pleura; wings brownish, b. n. falling short of t. m., first r. n. joining extreme basal corner of second s. m.; abdomen shining, with large punctures, the narrow entire bands dull pale fulvous; quite long spines at sides of fifth and sixth segments; apex with only four spines, the lower very long, slender, divergent; first ventral segment dull red.

*Hab.* Dapitan, Mindanao (Baker, 3152). Readily known from other Philippine species by the small size and the apical armature of abdomen. The apical armature resembles that of the Australian *C. froggatti*, Ckll., except that *C. dapitanensis* has the lower spines much longer.

*Ceratina tropica*, Crauford.

Dapitan, Mindanao (Baker, 3130, 3132).

*Ceratina philippinensis*, Ashmead.

Cuernos Mountains, Negros (Baker, 3131).

Professor Baker also sends two species new to the Philippines, which he collected at Los Banos, namely *C. beata*, Cam., and *C. dentipes* Friese, both determined by Friese. The first of these has been known from Ceylon and Burma, the second from Java.

*Allodape mindanaonis*, n. sp.

♀. Length about 7.5 mm.; like *A. marginata*, Sm., but pale yellow area of clypeus confined to the upper end and a median longitudinal band; tubercles yellow, but no line on prothorax; second submarginal cell longer; basitarsi black, with red hair.

Var. *a.* Only 6 mm. long, but apparently the same species.

*Hab.* Dapitan, Mindanao (Baker, 3164, 3163). The small



variety resembles the female of *A. cupulifera*, Vach. (det. Friese), taken by Baker at Los Banos, Philippine Islands, but is readily distinguished by the narrow, capitate, clypeal mark, the longer second s. m., and the red hair on hind legs.

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## A NEW GENUS AND FIVE NEW SPECIES OF HETEROCERA FROM THE PHILIPPINES.

BY A. E. WILEMAN, F.E.S.

### ARCTIADÆ.

#### TINOLIODES, Hampson, gen. nov.

Proboscis aborted, small; palpi porrect, extending as far as the frons which is clothed with rough hair; eyes smooth; antennæ of male bipectinate with rather short branches to apex; thorax clothed with rough hair; mid and hind tibiæ fringed with rather long hair on outer side and without spurs; a tuft of hair from below origin of hind wing; abdomen with lateral tufts of down-turned hair. Fore wing with vein 3 from long before angle of cell; 6 from upper angle; 7, 8, 9, 10 stalked; 11 from cell. Hind wing with vein 3 from before angle of cell; 4, 5 from angle; 6, 7 stalked; 8 from middle of cell; the under side in male clothed with rough hair scales.

In key differs from *Menas* in the mid and hind tibiæ being without spurs.

Type *T. benguetensis*.

#### *Tinoliodes benguetensis*, sp. n.

♂. Head and thorax ochreous yellow, two black spots on collar, and a black spot at base of patagia; abdomen ochreous yellow, black spots on the back, three black spots on anal segment. Fore wings grey brown with slight purplish tinge, base ochreous yellow with black spot at base of costa; a creamy white spot at outer end of the cell and an ochreous yellow spot above it on the costa; a creamy white spot below vein 2 and a small ochreous yellow spot on the dorsum. Hind wings ochreous yellow. Under side similar to above, but the fore wings are paler.

Expanse, 48 millim.

A male specimen from Palali (2000 ft.) in the subprovince of Benguet, Luzon. Captured December 27th, 1912.

#### *Diacrisia venata*, sp. n.

♂. Head and thorax pale buff, collar edged with crimson, patagia with crimson edges and black dots; antennæ bipectinated; abdomen crimson with black dots on the back of each of the four middle segments, pale buff dotted with black beneath. Fore wings yellowish orange, inclining to reddish on basal two thirds, venation pale ochreous; antemedial line represented by a black spot on the costa one fourth from base and two black spots below it near dorsum;

postmedial line indicated by a black spot on the costa one third from apex, an inwardly oblique streak from vein 3 to just below vein 2, and two dots near dorsum; fringes paler. Hind wings pale ochreous, tinged with reddish orange on dorsal area, veins darker, discoidal spot blackish. Under side of fore wings reddish orange; of hind wings pale ochreous, tinged with reddish orange on dorsum, discoidal spot black.

Expanse, 58 millim.

A male specimen from Haight's Place, Pauai, Luzon (7000 ft.), November 24th, 1912.

Closely allied to *Diacrisia whiteheadi*, Rothsch., from the Philippines.

*Diacrisia venata bipuncta*, ab. nov.

♂. Agrees with typical *venata* except that all but two of the black spots are absent, these are the pair forming dorsal end of the postmedial line and are very minute. The discoidal spot of hind wings is also absent.

Expanse, 56 millim.

A male specimen from Haight's Place, Pauai, Luzon (7000 ft.), December 5th, 1912.

*Deilemera conjuncta*, sp. n.

♀. Head and thorax white faintly yellowish tinged, spotted with black; antennæ bipectinated, pectinations weak; abdomen yellowish, banded with black, bands interrupted below. Fore wings blackish with a broad creamy white fascia from costa to tornus, outer edge of the band serrated, inner edge sinuous with a narrow projection above middle to a creamy white stripe from base. Hind wings creamy white, terminal border blackish, inner edge of border wavy and deeply indented just below the middle and again before tornus. Fringes of all wings blackish, white towards tornus. Under side exactly as above.

Expanse, 54 millim.

A female specimen from Baguio, Benguet subprovince, Luzon (5000 ft.), November 3rd, 1912.

Allied to *D. galbanum*, Swinhoe, from Luzon.

*Deilemera venata*, sp. n.

Head and thorax creamy white, dotted with black; abdomen pale yellow, with black bands above, spotted with black on sides. Fore wings white, venation darkened; hind wings white, venation not darkened. Under side similar to upper side, but veins of fore wings blackish.

Expanse, 58 millim.

One example of each sex from Haight's Place, Pauai, Luzon (7000 ft.), November 14th, 1912.

*Deilemera luzonensis*, sp. n.

Head and thorax white, slightly yellow tinged, dotted with black; abdomen pale yellow banded above and spotted below with black.

Fore wings pale brown, a whitish streak from base below median nervure to a whitish spot at end of the cell, the streak expands outwardly and this portion is separated into spots by the veins. Hindwings whitish, venation and terminal border pale brown. Under side similar to the upper side.

Expanse, ♂, 54 millim; ♀, 57 millim.

An example of each sex from Haight's Place, Pauai, Luzon (7000 ft.), December 1st, 1912.

Allied to *D. arctata*, Walk.

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## THE REARING OF LARVÆ.

WITH SPECIAL REFERENCE TO THE BRITISH LEPIDOPTERA.

By C. RIPPON, M.A., F.E.S.

LET me acknowledge at once that the rearing of larvæ is a very wide subject, and cannot be exhaustively treated by any one individual, much less by one like myself, whose knowledge and experience are not to be compared with those of many other entomological students, the professional section in particular. These jottings, therefore, are only put forward to raise a greater interest in the matter, and, if possible, to induce others to amplify and correct the conclusions arrived at. The two chief reasons for my dealing with the subject at all are: first, that my entomological friends have frequently suggested that my experiments in larvæ rearing would be worth recording in consequence of the success that has attended several of my attempts to rear species which are generally considered difficult; secondly, that I have met so many entomologists—some, indeed, whose names are almost household words—who have complained of their lack of success in breeding, yet who treat the rearing of larvæ in the most casual manner, and do not seem to realise that the larvæ of different species require very different treatment, and that all, except the most robust, require constant care and attention, especially when kept in confined quarters. Even some authors of works on the collecting of Lepidoptera often describe but one cage, as if all larvæ should be treated alike; and if, perchance, two or three different cages are mentioned, it is seldom pointed out that larvæ of different habits require different housing, the impression left on the reader being that the different cages are only described to enable him to select the one he likes best or can most easily secure. Altogether there seems to be a tendency with the majority of entomologists to treat the practical details of larvæ rearing as beneath their attention, whereas they really are of the first importance, for a large number of bred specimens are essential to the formation of a collection of real scientific value, to say nothing of the enormous knowledge to be gained

as regards the habits of Lepidoptera in their early stages and the effect of various influences on the perfect insect. I do not suggest that all I have to say is absolutely new, and a great deal of it seems to me very obvious. But whether the points are old and obvious or new and obscure, I trust their record may possibly be useful in some quarters. I would, however, mention that I do not write from the point of view of one who makes a business of breeding Lepidoptera, but from that of the ordinary collector, who may or may not have even a garden, and is certainly unable to give his larvæ the natural surroundings and conditions which the professional can do with his enclosed bits of land, large garden-frame-like houses in which the food-plants are growing, covered trees and shrubs, &c.

#### PRE-HATCHING INFLUENCE ON STRENGTH OF LARVÆ.

Every now and then the most careful of breeders comes across a batch of larvæ which fails unaccountably. I am convinced that this is not always due to incorrect treatment. Many of our Lepidoptera lay their ova more or less in batches. Now while larvæ hatched from the earlier laid batches will flourish, those from the last batch, though treated identically the same, are often most difficult to rear. This suggests that fertilization weakens towards the end of laying. There is no doubt, too, that many moths need pairing more than once adequately to fertilize all the ova, as for instance, *Palimpsestis octogesima*. When I first bred this species I found an extraordinary number of the ova infertile, while of the hatched larvæ a very small proportion appeared strong enough to thrive. By subsequent experiment I found that the *octogesima* female would readily pair up a second or even a third time, and that the ova first laid produced strong and healthy larvæ. This may, perhaps, be one of the reasons why *octogesima* is not more abundant, for the perfect insect is comparatively inconspicuous, the food-plant is common, and the larvæ generally well hidden — points which should help the species to increase and multiply.

#### FRESH AIR.

That plenty of fresh air is required by many larvæ is undoubtedly true, but that is not due so much to the fact that each individual larva wants a lot of air, as to the fact that in confinement so many are frequently kept in a comparatively small space that an abundance of fresh air is needed to counteract the troubles that the overcrowding would otherwise cause. This is demonstrated by the ease with which one or two quite large larvæ can often be successfully reared in a tightly-fitting glass-topped metal box. It is obvious, therefore, that when larvæ are small in size or few in number, or both, fresh air is a minor consideration, and nothing like so important, in most cases, as



keeping the food fresh and the larvæ on their food. It is happy this is so, as it greatly simplifies the treatment of very small and newly-hatched larvæ. Considering that newly-hatched larvæ of all but the largest of the British Lepidoptera will easily walk through muslin, and that the tendency of most species is to scatter directly they hatch, it is obvious that it is necessary to have almost air-tight receptacles if large numbers are not to be lost. Then, again, newly-hatched larvæ generally require tender foliage which quickly wilts in the open, and the constant changing of the food of such young larvæ is almost impossible without loss. Now a glass-topped metal box of suitable size meets both these difficulties admirably. Kept tightly shut—I sometimes even use an elastic band round the join in the lid—leaves will keep sufficiently fresh for days, sometimes for over a week; and there is certainly no fear of the larvæ escaping. The necessity of moving the larvæ until they have at any rate changed their first skin is thus obviated. The main trouble to guard against in glass-topped metal boxes is mould; if the boxes are thoroughly cleaned and sterilized before use, and care is taken not to put in food the slightest bit damp, it will be a long time before mould appears. Another good thing is to have plenty of boxes, so that when it is necessary to change the food the larvæ and the fresh food can be put in a fresh box. How long young larvæ should be kept in such boxes of course depends on their rate of growth, their ultimate size, and the number in each box. Small Geometers can be fed right up by gradually increasing the size of the box used and putting fewer in each one; soft Noctuæ larvæ are best moved out of the boxes as soon as they get from  $\frac{1}{4}$ -in. to  $\frac{1}{3}$ -in. in size. When the larvæ are first hatched I believe in using the smallest box suitable, and putting in the food so that it touches the glass lid when the box is shut. My reason for this is that newly-hatched larvæ have a tendency to go to the highest point and stay there—doubtless due to their instinct to get to the tenderest leaves—and, further, they require to be kept close to their food, or many will die before they start feeding. After the first instar this is not so important, though the keeping of larvæ fairly in touch with their food is a point which should not be lost sight of in all stages of growth.

#### FRESH FOOD.

With the exception of the larvæ of a few species who delight in wilted leaves and others who revel in decaying matter, fresh food is most essential to the successful rearing of most larvæ and particularly of those newly hatched. When using the word “fresh” it is meant in its literal sense, *i. e.* in growing condition. Many larvæ, which feed on the foliage of hard-wood trees and shrubs and some of the stronger-growing hedgerow plants, will do well if the stems of their food are kept in water

almost as long as the leaves refrain from drooping; but for those which feed on more succulent growths the use of water to keep the foliage fresh should be distinctly limited, and in some cases it is better to risk the larvæ having frequently to feed on wilted leaves than to use water at all, while in all cases it is best to change the food frequently. Some breeders seem very much afraid of supplying larvæ with wet food, but in the great majority of cases, to spray the food in the evening is a great advantage, and foliage recently rained upon is not to be despised. I, of course, in this refer to open cages, for in air-tight boxes the food must be dry. Another point in connection with feeding is the selection of the food. Care should certainly be taken to select that which is likely to be most acceptable. For instance, it is courting trouble to give a newly-hatched larva, which feeds on newly-opened buds, an old hard leaf. Foliage covered with dust, soot, &c., should be avoided, while stunted, diseased sprays of leaves or those infested with other insect life should be religiously passed by. On the other hand, it is not wise to use food from trees whose foliage has apparently been left untouched by all wild larvæ. When there is much honeydew about, the thorough washing of all foliage required for food is necessary.

When rearing larvæ whose habits are unknown, it is advisable to give a little of all parts of the food-plant available—old leaves, young leaves, buds, flowers, seeds, &c.; observe which is preferred and feed accordingly: but the test should be repeated every now and then, for often a larva which in its early days likes flowers may later on prefer the old and mature leaves. Care, however, should be observed when larvæ which feed on leaves reach their last instar or so, not to give them an exclusive diet of young and tender foliage, whether they prefer it or not, otherwise disaster may overtake the brood. In the later stages mature leaves alone usually form a safer diet. Personally, I attach great importance to the selection of suitable leaves and sprays for feeding, and in many cases always picking the food from the same tree or plant for a certain batch of larvæ is a factor towards success. I experienced rather a curious example of this not long ago. I was fortunate enough to obtain a few ova of *Neuria reticulata*. Knowing that this species was supposed to be difficult to rear, I took special pains with the larvæ and gave them bits of *Polygonum* from several different plants, whose foliage varied considerably in appearance. The larvæ much preferred one plant to all the rest, and fed up on it successfully. I was so impressed with this preference that I sent specimens of each plant to a botanical friend, and he reported that they were all precisely the same species of *Polygonum aviculare*, and three, including the one chosen by the *reticulata*, were of the same subspecies; he could only account for the difference in the appearance of the foliage and the prefer-

ence of the larvæ by some difference in the soil in which they grew. Yet they all flourished within an area of some one hundred square yards. After the selection of the sort of food comes the question of the amount of food to be given. Speaking generally, it is best to give a batch of larvæ an amount of food which they can entirely consume in a certain limited period. However well ventilated the cage, even if it is entirely composed of perforated zinc or muslin, it does not do to cram it full; the spray of foliage should stand free as it does in nature. It is far better for the larvæ to starve for two or three hours occasionally than for their cage to be choked up with food. Indeed, the health of some of the more voracious larvæ, which eat night and day, is sometimes distinctly improved by their being kept without food for a short while. In this, however, like everything else, the special habits of the larvæ affect the treatment. For instance, those who use leaves for habitats require more food in proportion to their number than other kinds. I refer to such genera as *Palimpsestis* and *Asphalia*. With some of these each larva requires two leaves for its habitat, so that if twenty larvæ were in a cage, sprays bearing sixty leaves would have to be given to enable each larva to have even one leaf for food; and as soon as twenty leaves had gone, more food would have to be added. Moral: keep very few such larvæ in the same cage, and on no account wait for the food to be entirely consumed, but add fresh frequently. I am not at all sure that the bad reputation of *Teniocampa populeti* for cannibalism is not largely due to keeping so many in the same cage that the larvæ have not enough leaves for habitats, let alone food, and consequently consume each other.

(To be continued.)

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## NOTES ON A LIME TREE APHIS, *PACHYPAPPA REAUMURI*, KALTENBACH, NEW TO BRITAIN.

BY FRED V. THEOBALD, M.A.

(Concluded from p. 76.)

### PROGENY OF THE FUNDATRIX.

ONLY one or two of them existed and unfortunately were left and became nymphæ. I thus append Del Guercio's description:—

“Yellowish brown, with four-jointed antennæ, rather longer than the whole body. Eyes red. Rostrum and feet well developed. Siphons quite distinct and black. The antennæ have the ‘nail’ the length of the fourth segment, and as the insect grows a fifth segment appears.”

This stage, only figured by Del Guercio in its first instar, is very marked, and very unlike the larva derived from the alate female.



## NYMPH. (Fig. 2, B &amp; E).

Length 2 to 2.8 mm. Yellowish to yellowish green and yellowish brown. Legs and wing pads, and sometimes the head, dark. Antennæ (fig. 2b) with the first two basal segments small, about equal in length; the third the longest, about equal to the fourth and fifth, which are about the same length; the sixth a little longer than the fifth, its "nail" short and blunt; a few hairs on all the segments,

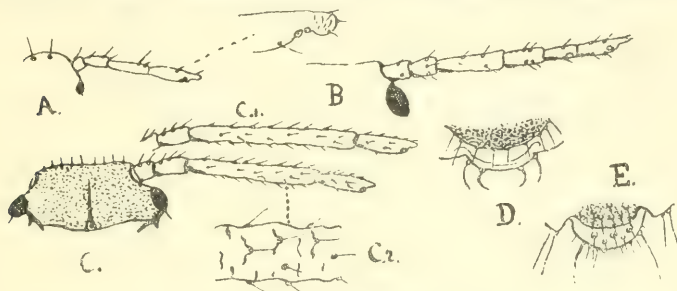


Fig. 2.—*Pachypappa reaumuri*, Kalt.

A. Head of larva from alate female; B. Head of nymph; C. Head of viviparous female; D. Cauda of viviparous female; E. Cauda of nymph.

and a single sub-apical sensorium on the fifth and sixth. Eyes large and dark. Rostrum yellow, dusky at the apex, reaching to the base of the third pair of legs. Apex of body with some long stiff hairs; cauda dark, hairy; anal plate pale, hairy; and a few hairs along the sides of the abdomen. Legs with minute hairs scattered on the tibiae and tarsi.

## ALATE VIVIPAROUS FEMALE (Figs. 3 &amp; 4).

Length 2.8 to 3 mm.; wing expanse 9 to 10 mm. Head, thorax, antennæ, and legs black. Abdomen yellow-green to dark green; cauda dusky to black. Antennæ not quite as long as the head and thorax (fig. 3, a); the first two basal segments small, the second somewhat globular towards the apex; the third the longest, with eight to ten sensoria spreading across the segment; the fourth rather more than half the length of the third and about equal in length to the fifth, or slightly shorter, with one or two slit-like sensoria and one rounded one near the apex (fig. 3A, a 3 and a 4); the fifth with a large, irregular sensorium near the apex (a 2) and, according to Del Guercio, a narrow one near the middle; the sixth about as long as the fifth, with a short blunt nail, with a few terminal hairs (a 1) and a sub-apical sensorium, or now and then slightly larger than the fifth; all the segments pilose. Eyes large and red to black; stemmata (D, d 1) pale. Proboscis (fig. 3B) reaching past the base of the second pair of legs, almost to the third pair, thin, the last two segments dark; remainder pale, the apex being jet-black; apical segment longer and narrower than the penultimate; hairs on one side of the last two segments and all over the long following one. Cauda dusky, and anal plate dark and spinose (c and c1). Legs rather long and thin; tibiae and tarsi with fine hairs. The abdomen (when the insect is prepared in balsam) shows two lateral rows of dark spots, each with a small pale



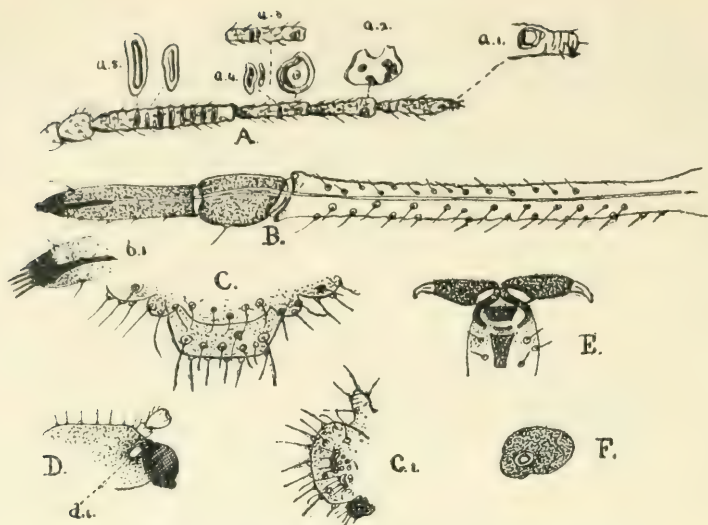


Fig. 3.—*Pachypappa reaumuri*, Kalt. (alate female).

A. Antennæ of alate female; A<sup>1</sup>. Further enlarged "nail"; A<sup>2</sup>, A<sup>4</sup>, and A<sup>5</sup>. Further enlarged sensoria; A<sup>3</sup>. Another form of third antennal segment; B. Proboscis; b<sup>1</sup>. Further enlarged apex; C. Cauda; C<sup>1</sup>. Side view; D. Head; d<sup>1</sup>. Stemmata; E. Ungues; F. Dark area at side of body.

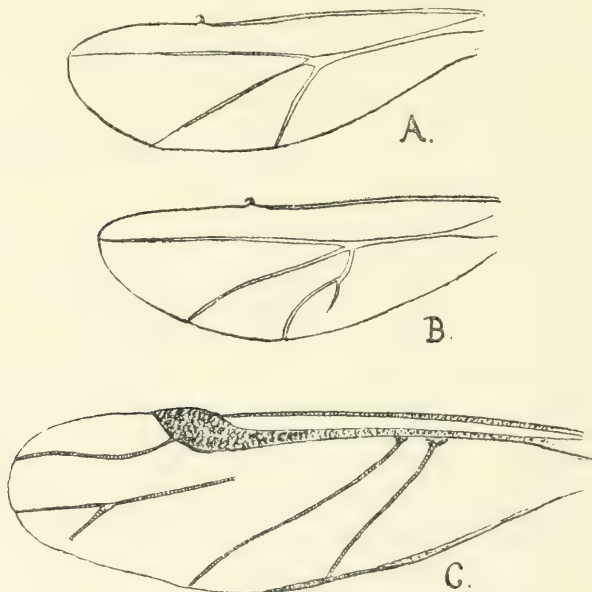


Fig. 4.—*Pachypappa reaumuri*, Kalt.

Wings of alate female: A. Hind wing; B. Abnormal form; C. Fore wing.

excentric spot (F). Lateral borders of the abdomen with a few fine hairs. Wings ample, smoky, with dark brown to black veins and dark rhomboidal stigma, the media reaching the edge of the wing, the cubitus often not reaching the edge of the wing; in the hind wings (fig. 4A) the radius, radial sector, and second anal arise close together and reach the edge of the wing normally as simple veins, but now and then the second anal is forked, the inner branch not reaching the wing border (B). This abnormality may often be seen in one wing and not in the opposite one.

LARVA FROM ALATE FEMALE. (Figs. 2A & 5).

Length on entering soil, .5 to .7 mm. Yellow to pale citron yellow. Antennæ (fig. 2A) of four

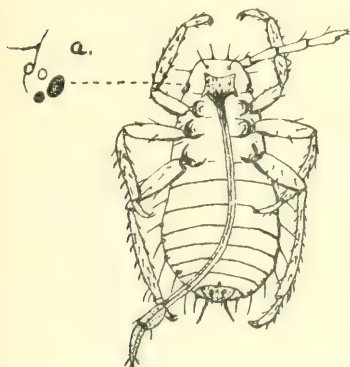


Fig. 5.—Larva from alate female  
(*S. P. reaumuri*, Kalt.).

segments, about half the length of the body; the first segment small; the second longer than the first, shorter than the third; the fourth a little longer than the third and slightly swollen, with a short blunt "nail" and sub-apical sensoria; a few pale fine hairs on all the segments. Eyes very small, composed of two dark red to black facets, and at the side two clear round areas (fig. 3a). Head rather narrow and long. Proboscis pallid, very slightly dusky at the apex, projecting far beyond the end of the body. Abdomen slightly swelling out apically and with a few long apical and lateral pale hairs. Legs pale, moderately long and thick. Anal plate dusky.

I do not enter here into its generic position, but have followed Del Guercio who, I think, is correct in retaining Koch's genus *Pachypappa*, and in placing this very interesting species in that genus. Its marked posterior wing venation may be of systematic value and so connect it with the type (*vesicalis*) of Koch's genus, but with this character must more surely go the marked sensorial character of the antennæ, and this marked character places *vesicalis*, *reaumuri*, and *corni* all very close together and yet far away from *Schizoneura ulmi*, *S. lanuginosa*, *S. fuliginosa*, and *S. lanigera*.

But the venation of the hind wings of *Pachypappa* differs from that of *Anæcia corni*, so they are placed in different genera. In one case I have seen and preserved an Aphid with the venation of *Schizoneura* on one side and true *Aphis* on the other, and in many cases in the same family all manner of venation within such wide limits that it seems to me one cannot rely on venation as of any value in this group of insects.

## THE BUTTERFLIES OF THE BUCKS. CHILTERN.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 80.)

## NYMPHALIDÆ.

25. *Dryas paphia*, Hb. I have not come across this species in any profusion; occasional specimens in the middle region, when brambles are in flower to attract. Professor Carlier includes it in his High Wycombe list. Mr. Spiller reports it from the west; scarce in 1914; and there are old records in the eastern districts from the neighbourhood of Drayton-Beauchamp and Halton.

Earliest date observed, August 3rd, 1899; latest, August 16th, 1906. Both these dates are obviously misleading as to time of emergence. Mr. Spiller records a specimen on June 10th, 1893, and another as late as September 17th, 1890 ('Entomologist,' xxiv. p. 3).

26. *Argynnis aglaia*, L. Undoubtedly the commonest of the down Fritillaries. The males often abundant where thistles are in flower. From the Wycombes to Drayton-Beauchamp, Aston-Clinton, and Halton. Mr. Spiller speaks of fifty counted in one morning on a hill-slope surrounded by woods as they successively turned at the top of the hill.

Earliest date observed, June 25th, 1914; latest, September 12th, 1907.

27. *A. adippe*, L. Much rarer, and more local than the preceding. Mr. Spiller says (*in litt.*) that it used to occur at Kingston Wood, "now turned into a pheasant farm, and the butterfly gone"; also formerly near Whiteleaf with *B. euphrosyne*. I have found it not uncommon in a certain dingle through which a wood path runs, and where some seasons there are lines of tall thistles. Professor Carlier reports it from High Wycombe; the Rev. H. H. Crewe from Aston-Clinton and Drayton-Beauchamp; the Rev. J. Greene from Halton.

Earliest seen, July 2nd, 1908, when the males were abundant; latest, September 12th, 1907—worn. In the extraordinarily hot spring of 1893 the Rev. F. A. Walker captured a specimen near Chalfont Road Station on June 8th ('Entomologist,' xxvi. p. 221).

28. *Brenthis euphrosyne*, L. This is another butterfly which escaped my notice for many years on the hills themselves, but Mr. Nander Hedges has informed me that it is locally common in the eastern Chilterns. I eventually found it in May, 1912, on the *adippe* ground, and also at Little Hampden the same day. I expect it is pretty well distributed in the enclosures on the south incline.

Earliest seen, May 30th, 1912; latest, "June 10th, 1914;

but known to occur a week later in previous years" (A. J. Spiller).

29. *B. selene*, Schiff. This is one of the Chiltern butterflies which has apparently been ousted from its former haunts in the eastern area. Mr. Peachell does not include it in his list (*in litt.*) of butterflies *not* taken in the High Wycombe district, so I conclude he met with it there before 1900; and Mr. Spiller reports "a few at Chinnor (just over the county border) formerly. Not seen this year, 1914." I have no personal knowledge of its appearance in the Chilterns; but it duly figures in the records of the Rev. H. H. Crewe for Drayton-Beauchamp and Aston-Clinton; and of the Rev. J. Greene for Halton. Probably haunts the southern slope woods, as it is reported from the neighbourhood of the Chalfonts.

30. *Melitea aurinia*, v. Rott. I was going to exclude this charming butterfly, so far as the Chilterns are concerned, from the number of species occurring there, when I received from Mr. Spiller welcome confirmation of its recent appearance well within the western extremity of the Bucks. hills. I have no intention of divulging the locality, as the species is already sufficiently rare. But at some previous time it must have enjoyed a wide range to the east, as both Drayton-Beauchamp and Halton are given as localities by the authorities quoted in Newman's 'British Butterflies.' Mr. Spiller remarks that the place chosen by the survivors in his direction is a puzzle, as they haunt the highest ground in the neighbourhood. The only locality communicated to me for *aurinia* anywhere within twenty miles is in a meadow by the side of the Chess River, in the county of Herts. I suspect the colony discovered by Mr. Spiller had been gradually driven from the low-lying ground by the encroachments of agriculture, or of sheep pasturage. But, as he points out, in the Alps *M. aurinia*, or rather its ancestral form var. *merope*, Prunner, climbs to the snow line.

[*M. athalia*, v. Rott. A Chiltern butterfly of old time recorded by the Rev. Joseph Greene from Halton, but Mr. Rothschild, who has a thorough knowledge of the locality as it is to-day, informs me that *athalia* has certainly disappeared, and that its chosen ground has been ploughed in. Mr. Spiller has searched the western ranges for it; I have spent many hours in likely-looking spots; but, until we can discover woods where *Melampyrum pratense* also survives, I fear that our efforts to restore the Heath Fritillary to the Chiltern list will be in vain. I am quite aware that other food-plants are given by the authorities, but I have observed abroad that, as a rule, *athalia* is really abundant—and it swarms in many places—chiefly where this particular plant flourishes.]

31. *Pyrameis cardui*, L. Common in *cardui* years, but other-



wise scarce. The best recent seasons for the species were 1906 and 1914, when it was abundant.

I have no early record of the immigrant appearances. Latest observed, October 1st, 1903.

32. *P. atalanta*, L. Always fairly common, affecting the *Eupatorium cannabinum* and scabious. It was in profusion one year upon a small plot of lucerne near the top of "a pass."

Earliest seen, *advena*, April 23rd, 1900; latest, October 9th, 1914, near Great Missenden. (In Middlesex to October 18th.)

33. *Vanessa io*, L. I have never found this species abundant; it was, however, fairly common in a small patch of lucerne, usually devoted to cereals, in August, 1909.

Earliest seen, after hibernation, April 20th, 1912; latest, May 23rd, 1904. Normal emergence, first seen, August 3rd, 1899; last seen, September 14th, 1908.

34. *Aglais urticæ*, L. First seen, March 17th, 1906; latest, a second generation from larvæ found on nettles and bred under natural conditions. First moult, September 12th. All had pupated, September 28th. Imagines from October 12th to 20th, 1907, some very dark; all showing a disposition to hibernate immediately.

35. *Eugonia polychloros*, L. Very rare. I have never found it in the Chilterns, though there are plenty of elms in the villages skirting the Vale of Aylesbury. Mr. Spiller says he took one at sugar in 1893, and saw some others in the western district, that being a year of plenty elsewhere. Not observed by Mr. Peachell (1900) at High Wycombe. Reported from Drayton-Beauchamp by the Rev. H. H. Crewe.

(To be continued.)

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## NOTES AND OBSERVATIONS.

ENTOMOLOGISTS AT THE FRONT.—Speaking in the House of Commons on Thursday, April 22nd, Mr. H. J. Tennant, Under-Secretary of State for War, paid a high tribute to the splendid work of the Royal Army Medical Corps. All epidemic diseases such as measles or typhoid had been brought under control and localised, and special illnesses to which troops are particularly prone had been either prevented altogether, or treated at so early a stage that recovery had been effected in the shortest possible time. Proceeding to explain the precautions adopted against summer sickness, he continued:—"Now that the rigours of winter were giving way to what might be the intensity of summer heat, they were rather apprehensive of a plague of flies and insects, and they had sent out, in order to combat that evil, entomologists of world-wide reputation, who were now engaged in taking such precautionary and preliminary steps as were possible while these creatures were in the larva stage

At home bacteriologists all over the country had taken in hand individual cases of cerebro-spinal meningitis, which was a most dangerous disease and which might be a scourge to the ranks, and he hoped and believed that that difficulty had been successfully overcome."—H. R.-B.

THE COPULATION OF SCORPION-FLIES.—On May 25th, 1914, I received from Mr. D. H. Gotch (who was unfortunately killed in action a short time ago) a living pair of *Panorpa germanica*, obtained by him at Oxshott the day before. About 11.30 a.m. I placed them together in a glass-bottomed box, and within a few minutes pairing took place and continued throughout the day. In the evening live aphids were introduced into the box as food, but it was not until the Scorpion-flies were exposed to the light of a table-lamp that they became active enough to take nourishment. They then fed together, still *in coitu*, but by 9.30 p.m. they had separated. During pairing the insects stood at an acute angle to each other; but beyond the fact that the male was holding the female from below with his claw-like terminal appendages, very little could be observed of the copulatory position, as the bodies were well hidden by the wings. In the morning of May 26th it was seen that both specimens were in a moribund condition, and they were consequently killed. No trace of eggs could be found in the box.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, March 29th, 1915.

LARVÆ OF *LYCÆNA CORYDON*.—On May 8th last year I found four young larvæ of *L. corydon* feeding on *Hippocrepis comosa* in Fleam Dyke, Cambs., a showery afternoon, and the grass very wet. On 31st of same month a great number of larvæ feeding, in pouring rain, in the Devil's Dyke: on both dates observations were made about 3 p.m., and therefore five hours or so before sunset. An examination of the same plants on June 4th revealed one or two larvæ concealed amongst the roots; the rest were invisible, nor had they pupated, as no pupæ were to be found, and some I took on the 31st did not pupate till June 17th. They evidently object to feeding in the sunshine. Nearly every larva I saw on the 31st was being "caressed" by three or four ants. Two larvæ of *Thecla betulæ* brought here on June 20th attracted a number of ants, which were busy caressing them for two days, as many as nine being counted on one larva: on the 22nd their attentions ceased, no doubt owing to the cessation of the skin secretions due to the forming of the pupal integument, as the larvæ pupated on 23th.—W. R. TAYLOR; 86, The Avenue, West Ealing, W.

BUTTERFLIES OF THE TAUNTON DISTRICT.—As a local record I think the following list of the butterflies of the Taunton district must be considered a good one. The district in question covers a radius of about ten miles from Taunton, and the number of species I have taken is forty-two; and if I include *V. antiopa* (seen by a friend of mine but missed) it is forty-three. I have seen a record of the capture of this insect within four miles of the town in 1877:—*P. brassicæ*, *rapæ*, *napi*, *E. cardamines*, *L. sinapis*, *C. edusa*, *G. rhamni*, *A. selene*, *euphrosyne*, *aglaia*, *adippe*, *paphia*, *M. aurinia*,

*V. polychloros*, *urticæ*, *io*, *atalanta*, *cardui*, *M. galatea*, *P. egeria*, *megæra*, *S. semele*, *E. ianira*, *tithonus*, *hyperanthes*, *C. pamphilus*, *T. betulæ*, *w.-album*, *quercus*, *rubi*, *P. phlæas*, *L. ægon*, *astrarche*, *icarus*, *corydon*, *argiolus*, *minima*, *N. lucina*, *S. malvæ*, *N. tages*, *H. thaumas*, *syllvanus*. It would be interesting to know if any other district of similar size can exceed this record.—W. B. BUTLER; Southgate, Wellington Road, Taunton.

GYNANDROMORPHOUS *SMERINTHUS OCELLATUS* × *AMORPHA POPULI* (HYBRIDUS, Steph.).—From the brood I obtained of this hybrid (mentioned in the 'Entomologist' of September last, p. 251) a gynandromorphous specimen, exactly halved, emerged on Feb. 9th; left side male, right side female. The left wings are pinkish, as in *ocellatus*, while the right wings are entirely grey. The eye-spots of *ocellatus* are well developed on both hind wings, as is also the red basal patch of *populi*. Right antenna like female *populi*, left like male *ocellatus*. Right half of body light grey, left half brownish grey. The thorax has the brown dorsal patch of *ocellatus*, but it stands up much higher and more tuft-like on the left (*ocellatus*) half—the right half looking exactly as if it had been sheared off. In many other respects the gynandrous character is apparent. It is a very curious though rather handsome-looking insect, and is quite perfect and well developed. As I imagine such an insect must be very rare, I thought it would be of interest to record it.—SYDNEY WHICHER; Westmead, Liss, Hants. (Plate VI., fig. 4.)

*PYRAMEIS ATALANTA*, ab.—I beg to enclose a photograph of an aberration of *Pyrameis atalanta*, which I had the good fortune to capture in my garden here in October, 1914. The red marginal band on the hind wings is pushed up as a symmetrical rounded wedge into the centre of the deep black-brown area, giving a striking and beautiful effect. The black spot corresponding to this part of the red band, instead of lying parallel to the edge of the hind wing, is carried up with the red wedge, and is at right angles to the direction of the other black spots. The fourth spot in the chain on the fore wings is distinctly pear-shaped. There is a very distinct white spot in the red band on the fore wings. The red band is divided in the centre by a black line. On the reverse surface of the fore wings is a fine series of arch-shaped blue lines extending from the fourth or pear-shaped white spot to the inferior angle of the wings. On the reverse surface of the hind wings is a long black line, flanked with pale mauve and corresponding with the wedge-shaped formation on the hind wings. Though I have bred a number of *P. atalanta*, and examined the butterflies in great quantities every autumn at ivy-bloom and fallen fruit, I have never come across any variety so marked and interesting as this.—G. E. J. CRALLAN; Gouray Lodge, Jersey, Channel Islands. (Plate VI., fig. 3.)

SMALL SIZE OF *PYRAMEIS ATALANTA*.—On September 13th, 1914, a specimen of *Pyrameis atalanta* emerged which was found to have a wing expansion of only two inches, the average size being quite two and a half inches at least.—E. REX. PHILLIPS; 64, Quantock Road, Windmill Hill, Bristol.



VANESSA ANTIOPA IN NORFOLK.—It may be of interest to record that on April 2nd a specimen of *V. antiopa* was taken at Holt, Norfolk, by Mr. Hammer. One wing-tip was slightly damaged, but otherwise the specimen was in good condition.—J. P. HEYWORTH; Woodbrook, Alderley Edge, Cheshire.

PYRAMEIS ATALANTA IN APRIL.—On April 2nd last I saw a very fresh specimen of *P. atalanta*, which I imagine must have hibernated in this locality.—G. NOBBS; North Lodge, E. Cowes, Isle of Wight.

MOTHS CAPTURED BY LIGHT-TRAP AT RINGWOOD.—The following is a list of moths taken in my moth-trap here. It is 4 ft. square, lighted by two incandescent gas lamps of 75 c.-p. each, and overlooks an expanse (nearly a mile) of water-meadows (with river), beyond which is a thick belt of wood; beyond which again, but quite out of sight, is an expanse of heath:—*S. ligustri*, *S. populi*, *N. cucullatella*, *C. miniata*, *L. mesomella*, *L. lurideola*, *E. cribrum*, *E. jacobææ*, *A. caia*, *A. villica*, *S. fuliginosa*, *S. lubricipeda*, *S. menthrasti*, *S. urticæ*, *P. similis*, *D. pudibunda*, *T. cratægi*, *P. populi*, *B. neustria*, *O. potatoaria*, *L. quercifolia*, *C. glaucata*, *D. furcula*, *P. palpina*, *L. camelina*, *N. dictæoides*, *N. ziczac*, *P. bucephala*, *B. perla*, *A. psi*, *A. megacephala*, *L. conigera*, *L. lithargyria*, *L. comma*, *L. impura*, *L. pallens*, *S. maritima* (two), *T. fulva*, *G. ochracea*, *H. niectitans*, *H. micacea*, *A. putris*, *A. strigula*, *X. lithorylea*, *D. scabriuscula*, *C. graminis*, *L. testacea*, *L. cespitis*, *M. brassicæ*, *A. basilinea*, *A. didyma*, *M. arcuosa*, *G. trigammica*, *C. morpheus*, *C. alsines*, *C. taraxaci*, *C. ambigua*, *R. tenebrosa*, *A. vestigialis*, *A. puta*, *A. segetum*, *A. exclamationis*, *N. plecta*, *N. c.-nigrum*, *N. festiva*, *N. rubi*, *N. xanthographa*, *T. ianthina*, *T. orbona*, *T. pronuba*, *A. tragopogonis*, *A. pistacina*, *A. lunosa*, *A. litura*, *X. fulvago*, *X. flavago*, *X. circellaris*, *C. trapezina*, *C. affinis*, *D. cucubali*, *D. carpophaga*, *A. nigra*, *S. cassinea*, *M. oxyacanthæ*, *P. meticulosa*, *H. oleracea*, *H. pisi*, *C. umbratica*, *H. tripartita*, *P. chrysitis*, *P. festuæ*, *P. gamma*, *P. moneta*, *A. myrtilli*, *C. nupta*, *U. sambucata*, *E. apiciaria*, *R. luteolata*, *S. bilunaria*, *O. bidentata*, *C. elingvaria*, *E. alniaria*, *E. fuscantaria*, *E. quercinaria*, *E. erosaria*, *H. pennaria*, *A. betularia*, *C. lichenaria*, *B. repandata*, *B. gemmaria*, *A. marginepunctata*, *A. aver-sata*, *T. amataria*, *C. pusaria*, *M. notata*, *H. vanaria*, *S. belgiaria*, *A. ochrearia*, *A. grossulariata*, *P. hippocastanaria*, *H. defoliaria*, *C. brumata*, *O. dilutata*, *L. viridaria*, *E. albulata*, *L. viretata*, *T. obeliscata*, *T. firmata*, *M. sociata*, *M. fluctuata*, *C. ferrugata*, *C. unidentata*, *C. fluviata*, *P. tersata*, *P. vittata*, *C. siterata*, *C. prunata*, *C. testata*, *C. populata*, *C. associata*, *E. cervinata*, *E. palumbaria*, *E. bipunctaria*, *A. plagiata*, *C. spartiata*. It will be noticed that *cribrum*, *belgiaria*, *myrtilli*, *hippocastanaria*, and *strigula* have been attracted to the light through, or over (?), the intervening wood. The results given above are for six years' use between May and November. My experience is that the only consistently productive nights are when there is a thunderstorm. Some other most promising nights sometimes yield no result. I believe *S. maritima* has not been recorded hitherto from Hampshire.—C. E. NEWNHAM; Ringwood, September 14th, 1914.



## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — Annual Meeting. — *Wednesday, January 20th, 1915.*—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., President, in the chair.—Mr. R. W. Lloyd, one of the Auditors, read the Auditors' Report, which was adopted on the motion of Mr. E. B. Ashby, seconded by Mr. Tonge.—The Rev. G. Wheeler, one of the Secretaries, then read the Report of the Council, which was adopted on the motion of Mr. W. J. Lucas, seconded by Mr. Hugh Main.—No other names having been received in addition to those proposed by the Council as Officers and Council for 1915, these were declared by the President to be elected.—The President then delivered his Address, illustrated by the epidiascope, after which Mr. Merrifield proposed a vote of thanks to him, remarking on the patience and research needed for such a paper, and, while asking that it might be printed as a portion of the Proceedings, expressed a hope that the illustrations might also be reproduced. Dr. Jordan seconded the motion, which was carried unanimously.—The President, in replying, said that he was offering twelve plates to the Society in illustration of the Address.—Mr. Hy. J. Turner then proposed a vote of thanks to the Officers for their services, which was seconded by the Rev. F. D. Morice. The Treasurer and both Secretaries replied.—REV. G. WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 11th, 1915.*—Mr. A. E. Gibbs, F.L.S., Vice-President, in the chair.—Mr. Baumann exhibited a bred series of *Ephyra pendularia*, including a considerable percentage of ab. *subroseata*. They were a second generation from larvæ beaten in Surrey.—Mr. Gibbs, a specimen of the huge Noctuid *Thysania agrippina* from Costa Rica, where it sits on tree trunks, as does a *Eupithecia*.—Mr. Whicher, a remarkable gynandromorphous hybrid, *Smerinthus ocellatus* male  $\times$  *populi* female, in which the left side was male and the right side female.—Mr. Hy. J. Turner, a copy of an uncommon work, 'Illustrations of British Mycology,' by Mrs. Hussey, 1846, with ninety-two coloured plates, which he had recently bought cheap, as it was about to be torn up by the bookseller to dispose of the plates at a few pence each as "pretty pictures."—The rest of the evening was devoted to exhibitions under microscopes.—Mr. Adkin, the structure of the cocoon of *Dicranura vinula* and antennal structure in Lepidoptera.—Mr. Edward, a species of *Nycteribia*, the parasite of the Fishing-bat.—Mr. West (Ashted), androconia of *Pieris brassicae*, a *Coccus* found on bananas, and *Hypoxylon coccineum*—a micro-fungus on wood.—Mr. Coxhead, a number of mites infesting a brazil-nut.—Mr. Ashdown, minute species of Coleoptera and Hemiptera.—Mr. Bunnett, larva of a Thrips which had been attacked by a micro-fungus.—Dr. Chapman, skins of the first and last stages of the larva of *Everes argiades*, with figures and illustrative notes on the same.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, *January 18th, 1915*, Dr. J. Cotton, Vice-President, in the chair.—Mr. Wm.

Mansbridge read a paper entitled "Silverdale as a Collecting Ground." Having given a brief survey of the geology and flora of the district, the author enumerated a large number of local species of Lepidoptera generally rare in the North of England, but which had been recorded from this favoured area. Many of these, however, had not been reported for a couple of decades or longer, and members were urged to endeavour to confirm such records as *L. corydon*, *T. betulæ*, *P. egeria*, *E. hyperanthes*, *L. minima*, *S. malvæ*, *S. anomala*, *A. marginepunctata*, *L. olivata*, and *E. teniata*, all of which had been recorded some thirty years ago. He also referred to the two field meetings which had been held at Silverdale—gatherings that had been greatly enjoyed by all who had attended. The author mentioned having taken a fine specimen of *Coccyx cosmophorana* on May 30th, 1914, in Gatebarrow Wood; also *Adela fibulella* and *Eupithecia constrictata*.—Mr. A. W. Hughes exhibited Lepidoptera from Eastham as follows: *Hybernia defoliaria*, *H. aurantiaria*, and a very long series of *Cheimatobia brumata*, the latter showing great variation from very pale to very dark brown, almost chocolate-coloured forms; the last were scarce, forming only three per cent. of the number captured. *H. aurantiaria* had not been recorded previously for the locality.—Mr. F. N. Pierce showed his extensive series of the genus *Cnephasia* (*Sciaphila*), containing all the British species except *vahlbomiana* and *abrasana*; with regard to these he stated that it was considered very doubtful whether they had any right to be included in the British Fauna, or even to be ranked as good species at all. The variation was remarkable in that almost every species showed both melanism and albinism, and it is only by a microscopic examination of the genitalia, which can easily be done without damaging the specimen, that the moth can be identified, especially when it approaches the extreme variation.

February 15th, 1915.—Dr. J. Cotton, Vice-President, in the chair.—The evening was devoted to a pocket-box exhibition of natural history objects.—Mr. F. N. Pierce contributed a selection of "insect habitations," which included portable cases characteristic of the Psychidæ, Coleophoridæ, and the Trichoptera; he also showed the cases of the Coleophoridæ under the microscope, and called attention to the character of the silk of which some of them were composed.—Mr. R. Wilding exhibited a number of Tortrices collected in the neighbourhood of West Derby, including series of the following: *Dictyopteryx holmiana*, *Catoptria cana*, *Orthotenia striana*, and many of the common hedgeside species.—Dr. J. Cotton, a box of *Triphæna fimbria* and *Carsia paludata* from near St. Helens.—Mr. W. Mansbridge brought a specimen of the fungus *Polyporus betulinus*, which, when dried and cut into strips, he used for mounting Micro-Lepidoptera; also a series of *Mimæsioptilus bipunctidactylus*, cinnamon-coloured form, from the Crosby sandhills, and a short series of a melanochoic variation of *Ellopiæ prosapiaria*, bred from a Delamere female; he stated that, although not usually so dark as the present family, the species is considerably darker at Delamere Forest than in the South of England.—WM. MANSBRIDGE, *Hon. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—January 6th, 1915.  
—Mr. J. E. R. Allen showed *L. flavicinctata* from Co. Fermanagh

and Braemar; pale forms from the limestone rocks.—Mr. J. E. Cope exhibited *Anthia decemguttata* (?) from Stellenbosch, Cape Colony, October, 1914.—The retiring President, Mr. J. H. Watson, discussed "Some Interesting Points in Insect Anatomy." By means of the lantern microscope he illustrated his remarks with suitable slides.

*February 3rd, 1915.*—Mr. Mansbridge opened the evening with a discussion on experiments made with regard to the melanic form of *B. repandata*, illustrating with specimens and figures showing results obtained.—Mr. V. Coryton exhibited Lepidoptera taken at Dekanere, &c.—Mr. W. Buckley, two specimens of *D. galii* from Cornwall.—Mr. Johnson, *T. gracilis*, showing rosy forms, from Scotland; paler forms (one with slight rosy flush), clay-coloured and greyish forms from Lancs. and Cheshire; also very deep red specimens from New Forest; also a short series of *T. variata* and *T. obeliscata* for comparison.—Mr. A. Binns showed *P. chrysitis*, *N. plecta*, *H. micacea*, *H. aurantiaria*, *H. defoliaria*, *A. plantaginis*, *A. grossulariata*, all taken locally (Manchester).—Mr. L. Nathan, *O. antiqua*, male and female, bred July, 1914, from Manchester ova; *Vespa vulgaris*, female, Moss Side, October, 1914; *T. obeliscata*, W. Didsbury, October, 1914.—Mr. J. H. Watson, living specimen of a new subspecies of *Philosamia cynthia* from Tsing-tau; also Diptera (Tachinids) infesting the Saturniid *Antherea roylei*, from Khasia Hills, Assam.—Mr. J. H. Shorrocks, photo-micrographs of dissections of common cockroach.—Mr. L. H. Suggitt, a selection of large Lamellicornia, including male *Dynastes*.

*March 3rd, 1915.*—Mr. Pierce, of Liverpool, read a most interesting and instructive paper entitled "The Genitalia of the Lepidoptera." The lecturer opened his subject by giving a short history of the work which has been done in this branch of our entomological science, and afterwards, by means of slides shown upon the screen of the genitalia of many Lepidoptera, demonstrated the practicability of determining genera and species by this method.

LONDON NATURAL HISTORY SOCIETY.—*January 5th, 1915.*—Mr. T. H. Archer, of 52, Elsenham Street, Southfields, and Mr. A. E. Hoap, of Southfields, were elected members of the Society.—Mr. C. H. Williams exhibited a long series of *Dianthæcia conspersa* from the Shetland Isles and a few specimens from Croydon.—Mr. L. B. Prout, the retiring President, read his presidential address.

*January 19th, 1915.*—The Rev. C. E. Raven, of Cambridge, was elected a member of the Society.—Mr. L. B. Prout exhibited two cabinet drawers containing a series of nearly all the British species of *Eupithecia*, including very variable *E. subfulvata* and its Scottish forms *cognata*, &c.; *E. pygmaea*, captured flying over a heap in the afternoon at Doncaster; melanic forms of *E. castigata*, *E. albipunctata*, *E. vulgata*, &c.—Mr. H. W. Wood, *E. castigata* and its melanic form *ab. obscurissima*, Prout; *E. innotata*, showing first and second brood usual forms, and some without the usual markings, also of both broods, from Durham; and *ab. fraxinata* from Middlesbrough; also larvæ of *Pieris brassicæ* taken in a garden at Southfields on January 17, several degrees of frost being registered that morning.—Mr. Bernard Cooper, a varied series of *Mimas tilia*, bred from a Lyndhurst female taken June, 1913.



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## NOTES ON ODONATA FROM THE ENVIRONS OF CONSTANTINOPLE.

BY KENNETH J. MORTON, F.E.S.

ON several occasions, by the courtesy of Mr. Philip P. Graves, I received small collections of Odonata kindly made by him around Constantinople, taken on both the European and the Asiatic side of the Bosphorus and Sea of Marmora. Mr. Graves's valuable communications on the butterflies of the Near East are well known; but he had also developed a considerable interest in the dragonflies, and had promised a further consignment last autumn, from which I had hoped to give a more complete account of the Odonata occurring near Constantinople. The circumstances which prevented the fulfilment of this promise do not need explanation, and as the material already on hand is of sufficient interest I propose to deal with it now. A few quotations from Mr. Graves's notes are indicated by the initial letter G.

### CALOPTERYGIDÆ.

*Calopteryx virgo*, Linné, race *festiva*, Brullé.—Female, Beikos Woods, Asiatic side, June 6th, 1914 (teneral); female, Belgrade Forest, European side, June 11th, 1914; male, Oakwood, Kartal, Asiatic side, May 17th, 1914 (sub-teneral).

*C. splendens*, Harris.—Male, Gyök-su, Asiatic side, May 27th, 1914 (seen June 30th on Riva River, Asiatic side, G.). The dark apical portion, starting 1-2 cells, beyond the nodus is regularly convex on its inner side; tip of wing very narrowly hyaline, in this respect resembling examples from Pavia, Italy. In Western examples of the race *xanthostoma* the inner margin of the dark apical portion is not so regularly convex, being usually more irregular in outline. The Constantinople male also recalls *C. amasina*, Bartenef, which, however, has the hyaline apex rather more extended.

### AGRIONIDÆ—LESTINÆ.

*Lestes viridis*, Vanderl.—Male, Gyök-su, October 28th, 1913.

*L. dryas*, Kirby.—Female, Mavri, Asiatic side, May 30th, 1914; two males, Belgrade Forest, June 23rd, 1913.



## AGRIONINÆ.

*Platynemis pennipes*, Pallas.—Two males, Gyök-su, end of May, 1913, May 24th, 1913; female, Asiatic side, June 19th, 1913, var. *lactea*; male and female, Erenkeui, seven miles from Constantinople, Asiatic side, May 11th, 1913, var. *lactea*.

*Ischnura elegans*, Vanderl.—Male, Gyök-su, July 10th, 1913.

*Agrion scitulum*, Ramb.—Female, Gyök-su, July 10th, 1913; two males and two females, Kartal, at cattle pond, May 17th, 1914 (pair); female, Belgrade Forest, end of June, 1913.

*A. puella*, Linné.—Male, European side, June 23rd, 1913; female, Gyök-su, May 16th, 1913.

## ÆSCHNIDÆ-GOMPHINÆ.

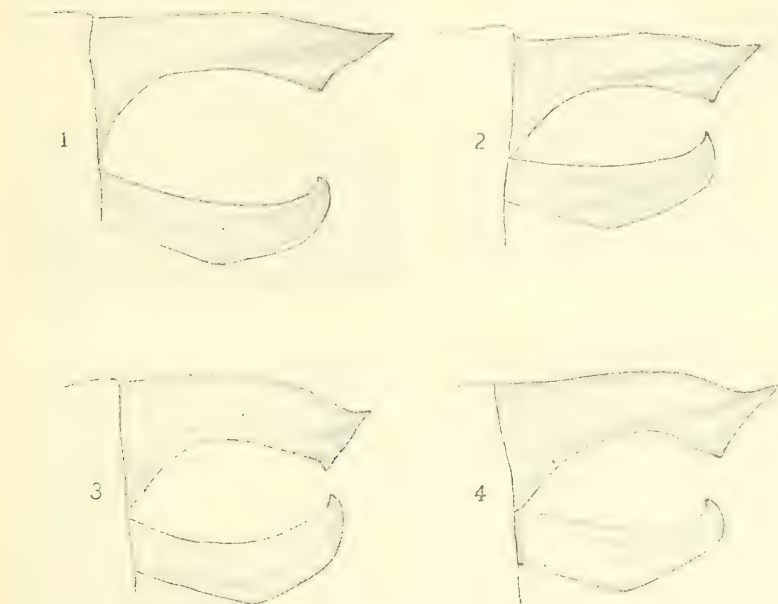
*Gomphus schneiderii*, Selys.—One male, Beikos, June 13th, 1913. This example demands a somewhat extended notice. The species was originally described by De Selys ('Revue des Odonates,' p. 292, 1850). Later he regarded it as a race of *G. vulgatissimus*, a view which has been adopted by Bartenef.

De Selys gives the following differences between *G. schneiderii* and *G. vulgatissimus*. In *G. schneiderii*:—

- (1) The size is smaller; the form more slender.
- (2) The black design of the front similar, but the black lines more slender; the lateral lobes of the lower lip in great part yellow externally (more so than in *vulgatissimus*).
- (3) The thorax beneath after the hind legs is almost all yellow (in *vulgatissimus* it is almost all black).
- (4) The anterior femora have, besides the pale yellow inner band which one sees ordinarily in *vulgatissimus*, a little line of the same colour at the base of the superior face, and a similar line on the intermediate femora.
- (5) The superior appendages are a little different. In *vulgatissimus* they are almost cylindrical and suddenly pointed at the extremity; in the species of Asia Minor they are more divaricate, cylindrical, but insensibly pointed; seen from the side they are truncate ventrad at a more oblique angle. The abdomen, it is stated, with a dorsal yellow line to seventh segment, but this character may be variable.

The typical examples were from Kellemisch, in Asia Minor, and I possess a short series from Amasia agreeing very well in most respects with the above. The abdomen, however, has in two specimens the yellow line to segment nine (and strongly marked thereon), while in another the yellow line on eight and nine is much reduced. In addition to the more slender aspect, the wings appear to be narrower than in *vulgatissimus*, there being only three series of cells in the fore wings between Cu 2 and the wing margin, a feature usually noticeable in *G. simillimus*.

The male from Beikos is rather remarkable. It has the narrow wings of *simillimus-schneiderii*, and traces of the yellow dorsal line on segments eight and nine; the median lines on the anterior part of the thorax are produced laterally as in *simillimus*. I hesitate to separate this example from those from Amasia, but it raises a doubt as to whether *schneiderii* is really to be closely associated with *vulgatissimus*, as proposed by De Selys and as Bartenef has done in his various writings.



PROFILE VIEW OF APPENDAGES.

- |   |  |
|---|--|
| 1. <i>Gomphus schneiderii</i> , Constantinople. | 2. <i>G. schneiderii</i> , Amasia, Asia Minor. |
| 3. <i>G. vulgatissimus</i> , near Zürich.       | 4. <i>G. simillimus</i> , Le Blanc, France.    |

The real connection seems rather to be with *G. simillimus*, and if I had been dealing with this Beikos example alone, I should have decided that it was a melanic Eastern race of *G. simillimus*, a view which receives support from Bartenef's record of *G. vulgatissimus vulgatissimus* and *G. vulgatissimus schneiderii* from the same locality in Montenegro ('Notice sur les Odonates du Montenegro,' Revue Russ. d'Entom. xii. 1912, No. i. p. 79). The appendages of the Beikos example agree with Bartenef's figure of *G. vulgatissimus schneiderii* (Arb. Lab. Zool. Kab. Univ. Warsaw, 1912, Odonata of Signakh and Telav

district of Tiflis Government, p. 23) which resembles *G. simillimus* in the structure of these appendages, and the Amasia examples show the same characteristics, but not in such a pronounced degree. The Beikos insect differs from those from Amasia as regards the black median lines on the front of the thorax, these in the former being as in *G. simillimus*, while in the Amasia specimens the resemblance is rather with *vulgatissimus*. The black condition of the legs of the Beikos insect, of which more material is to be desired, recalls *vulgatissimus*, while the black lines of the thorax and the structure of the appendages are closer to those of *simillimus*.

It may be useful to contrast a description of *G. simillimus* (after De Selys) with notes on the Beikos male:—

*G. simillimus.*

Front of head yellow with a single black transverse line on the front; lower lip yellow; occiput yellow, space round ocelli black. Back of head yellow with a large black spot behind the eyes prolonged towards their middle.

Prothorax black spotted with yellow.

Thorax yellow with six straight black lines rather thick upon the front; the two median contiguous a little broadened anteriorly and touching the prothorax by a little prolonged point; the antehumeral very close to the humeral,\* the sides of the thorax have besides a black oblique posterior line and another intermediate, short, which branches towards the legs and forms a spot behind the posterior legs.

Interalar space yellow spotted with black.

Abdomen moderate, a little constricted from 3rd to 6th segments, increasing a little towards the extremity of which the sides are a little dilated and the under side concave.

The abdomen is black spotted with yellow thus:—

The arête and a great spot posteriorly in 1st segment; a dorsal spot with three lobes touching almost both ends of 2nd.

*G. schneiderii* (Beikos).

Frons yellow with a rather heavy black line between frons and nasus, with two rectangular black extensions on the latter; rhinarium, which has the anterior angles black, with blackish lines. Labrum with both margins heavily lined with black, and a median black virgule. Labium blackish. Behind the eyes black with a large yellow spot.

Prothorax black, anterior margin yellow, a large yellow rounded spot at each side and a small central twin spot.

Thorax yellow with six straight thick lines on the front, the two median contiguous a little broadened anteriorly and touching prothorax by a little prolonged point; the antehumeral and humeral close, separated by a space about equal or rather less than their breadth; on the side is a short black line which broadens out over the middle legs and joins the humeral, while another complete narrow line forks over the hind legs, the posterior branch forming a large black marking behind these legs.

Interalar space yellow spotted with black.

Abdomen black spotted with yellow thus:—

1st segment mostly yellow, a black marking on each side of dorsum; a dorsal spot with three lobes touching both ends of 2nd segment, central lobe much the largest.

\* These almost touch in *G. vulgatissimus*.

*G. simillimus.*

3rd, 4th, 5th, 6th, 7th and 8th with a yellow ray composed of dorsal longitudinal narrow spots a little broader anteriorly, pointed behind, and not touching at all the posterior margin.

9th with a very large oval spot touching both ends.

10th with a small triangular posterior spot.

The anterior articulations of the three last segments, the oreillettes, all the back of the posterior genital lobe, the sides of the base, and of the end of the abdomen, and a lateral trilobed spot on the five intermediate segments, yellow.

Appendages as long as last segment. Superior black, a little separated at base, cylindrical, a little swollen; if viewed from above, terminating suddenly in a little very acute point; viewed in profile one sees a little before the point beneath something like a small projecting blunt tooth. Inferior appendage forked, yellow with black lateral branches not more widely apart than the superior.

Legs yellow; the femora with a triple black line, the tibiæ black inwardly, all the tarsi black.

*Onychogomphus forcipatus*, Linné.—Male, Gyök-su, May 24th, 1913; female, Riva-su, May 2nd, 1913. These show little tendency towards the meridional race. The male has, however, traces of a yellow dorsal line on the eighth segment; the ninth is yellow, posteriorly interrupted with black in the middle.

## CORDULEGASTERINÆ.

*Cordulegaster charpentieri*, Kol.—Two males, Belgrade Forest, June 23rd, 1913, June 21st, 1914. These examples are very similar to a male given to me by Bartenef from Lagodechi in the Caucasus, the locality whence De Selys received a series which he referred first to his *C. pictus*, and later, I believe, to *C. charpentieri*, Kol. That these really represent *C. charpentieri*, Kol., seems to me not altogether beyond doubt. I hope to return to this point again.

## ÆSCHNINÆ.

*Brachytron hafniense*, Müller.—Male and two females, Kutchük Tchekmedjé, on Sea of Marmora, European side, April 25th (Male, near lake, G.).

*G. schneiderii* (Beikos).

3rd, 4th, 5th, 6th and 7th with a yellow ray composed of dorsal longitudinal narrow spots, those on 6th and 7th especially a little narrower behind.

8th and 9th with much smaller and shorter markings.

10th all black above.

The anterior articulation of the three last segments, the oreillettes and sides of segment 2; a large basal lateral spot on segment 3; small basal spots on sides of segments 4, 5 and 6; a large irregular spot on 7; 8th and 9th with greater part of sides, and 8th, 9th and 10th ventrally, yellow.

Appendages black.

Compare the figures of the profile view.

Legs entirely black, with the exception of traces of yellow on anterior femora.



*Calieschna microstigma*, Schneider.—Male, Belgrade Forest, beginning of June, 1913; female, Beikos Woods, middle of June, 1913. (May 29th, 1914, the *Calieschna* is well out now in the woods. It is very fond of flying up and down wood paths, however shady and dark they are, G.)

*Anax parthenope*, Selys.—Female, Belgrade Forest, June 28th, 1914.

#### LIBELLULIDÆ—CORDULINÆ.

*Somatochlora metallica*, Vanderl.—Male, Belgrade Forest, June 23rd, 1913. (June 29th, 1914.—Common now in the woods, G.)

#### LIBELLULINÆ.

*Orthetrum cancellatum*, Linné.—Male (occurs end of June and beginning of July, Asiatic side, G.).

*Libellula depressa*, Linné.—Male, Gyök-su, June 19th, 1913; female, Sweet Waters of Asia, May 16th, 1913. (Everywhere, but usually in small numbers, G.)

Mr. Graves also mentions the following species, of which I have not seen specimens:—

*Lestes barbarus*, Fabr.—Erenkeui, on Sea of Marmora, June 8th, 1913.

*Sympetrum meridionale*, Selys.—End of June, 1913.

*Crocothemis erythræa*.—Fairly common on both sides of the Bosphorus, end of June and beginning of July.

*Anax imperator*, Leach. Not common; end of May, June, and July.

An *Erythromma* was observed commonly about the middle of July on the Gyök-su River.

### BRITISH ODONATA IN 1914.

By W. J. LUCAS, B.A., F.E.S.

(PLATE VIII.)

IN early seasons dragonflies may be expected to make their first appearance about April 20th, consequently, in so forward a spring as that of 1914 the presence of *Pyrrhosoma nymphula*, Sulz., on the wing by the 21st was not an exceptional occurrence. On that date I captured a female in the New Forest, and saw others which there was no reason to doubt belonged to the same species. On April 27th, in another part of the Forest, I took a female of *Brachytron pratense*, Müll., which species I had not

previously captured earlier than May 14th, although Mr. C. A. Briggs once met with it at Egham on April 29th.

Col. J. W. Yerbury gave me a teneral male of *Calopteryx virgo*, Linn., which he took at Shaugh Bridge on May 18th. He said that it was "in numbers on the banks of the Plym."

On May 20th I visited the Black Pond on Esher Common in Surrey, and there found on the wing *Cordulia ænea*, Linn., and *Libellula quadrimaculata*, Linn. On May 31st I went in search of dragonflies along Oberwater and in its neighbourhood in the New Forest. *P. nymphula* was very common, and pairs were frequently flying connected *per collum*. A small plant of *Drosera intermedia* had caught a female by the end of the abdomen, and one leaf apparently was powerful enough to hold it a prisoner. *C. virgo* was fairly common, and pairs were sometimes seen connected *per collum*. Of *Agrion mercuriale*, Charp., I captured several females, but of males I caught none, though I probably saw just a single specimen. Presumably the females were earlier than the males. A few teneral examples of *Orthetrum cærulescens*, Fabr., were seen, and a female was captured. As I found nymph-skins of *Cordulegaster annulatus*, Latr., on *Myrica gale* this species must have been out, but I did not see imagines. I was specially on the look-out for *Gomphus vulgatissimus*, Linn., and *Ischnura pumilio*, Charp., but did not recognise either, nor could I find them in the Forest on June 22nd, nor yet again at the beginning of July. At the end of June, in addition to the species seen on May 31st, *Platynemis pennipes*, Pall., and *Pyrrhosoma tenellum*, Vill., were on the wing. On June 20th in the New Forest a few full-coloured blue *O. cærulescens* were seen, and in close proximity to a very teneral specimen I secured a nymph-skin.

On June 14th Mr. W. H. Pearsall (Dalton-in-Furness) sent me a specimen of *C. virgo*, in connection with which he said:—"The flies were in some quantity, hovering—a most beautiful sight—over *Scirpus lacustris* in Rusland Pool, between Haverthwaite and Rusland in North Lancashire."

Mr. C. W. Bracken, in the early summer, took a pair of *P. nymphula* at Landrake on a creek of the Tamar (May 16th) and found *C. virgo* common on the River Plym (June 3rd), and *Enallagma cyathigerum*, Charp., male and female, on the upper courses of the Plym at the edge of the moor (June 29th).

From July 31st till September 12th I was in the New Forest where I met with *P. tenellum*, and its vars. *erythrogastrum* and *melanotum*; *E. cyathigerum*; *O. cærulescens*; *C. virgo*; *Sympetrum striolatum*, Charp.; *C. annulatus*; *A. mercuriale*; *Sympetrum scoticum*, Don; *P. pennipes*; *P. nymphula*; *Ischnura elegans*, Lind.; *Æschna cyanea*, Müll.; *Lestes sponsa*, Hans; *Æschna juncea*, Linn.; *Libellula depressa*, Linn.—fifteen species. So late

as August 18th *S. scoticum* and *S. striolatum*\* were seen in teneral condition, and the former was still emerging, if not the latter also. I brought away a nymph-skin of *S. scoticum*, and from that and others I have made the drawing and description of the nymph which accompany this paper. On August 19th in Pound Hill Inclosure I captured a nice female, *Æ. cyanea*, with greenish markings. When I removed it from the net it was headless. The head was, however, found clinging to the inside of the net. Apparently it was biting the net, and either could not or would not let go, and its body was dragged from its head. How slight is the connection, and how small must be the separate particles of food that can pass into the stomach! I was surprised at capturing a female *L. depressa* at Oberwater so late as August 29th. The specimen was in such good condition that it could not have been on the wing, one would think, since the beginning of the season. A male and a female of *C. virgo* were seen on August 31st, after I had lost sight of the species for several days. On September 2nd *P. tenellum* and *S. scoticum* were numerous, and I took a male *A. mercuriale*; *O. cærulescens* was in considerable numbers. On September 5th *S. striolatum* was very common in the bright sunshine during the afternoon in a ride near Woodfidley. During my stay in the Forest *C. annulatus* was again common. On September 7th near Holmsley *Æ. cyanea* and *Æ. juncea* were found to be rather common, and I captured of the former three males, and of the latter one male and two females. A male pounced down on a female, which I had not noticed on the surface of the vegetation in very shallow water. I succeeded in capturing both, and found them to be: one a male *Æ. cyanea* and the other a female *Æ. juncea*, and they evidently were intending to pair. Later, a male was seen to fly down to a female in a similar way; but this time I caught the female only—*Æ. juncea*. After this, two or three males kept flying to and from the spot, and their manner left no doubt that they were searching for the female. At last I captured one and found it to be *Æ. juncea*.

More than once I visited the pond where, in 1911, *Sympetrum fonscolombii*, Selys, occurred, and I think it may safely be said that none were present in 1914. Mr. Haines, however, was

\* In continuation of the interesting notes supplied by Miss D. Molesworth (*vide* Entom. xlvii. p. 80), she adds, writing March 10th, 1914:—"Of the *Sympetrum* eggs, which I told you of as having hatched in less than three weeks last autumn, the largest, in a big aquarium, is now about 9 or 10 mm. long, while none of those of the same batch, in a small bottle, have reached 2 mm. in length. I feel almost certain that the smaller nymphs did not hatch till quite two months after the larger ones, for the latter ate all their relatives that I could see, and were nearly 3 mm. in length before I removed them to a bigger aquarium. I notice that a demoiselle nymph, which had lost two of its 'tails,' has now got two half-sized new ones by its last change of skin."



more fortunate, and he has sent me the following interesting note on that and other Dorset Odonata in 1914 :—"On July 10th I found *Sympetrum fonscolombii* plentiful at the Wareham Pond where I had noticed it in previous years, and took seven males and one female, the latter *in copula*. The next day I found it in its other former locality on Knighton Heath. On July 13th the females were exceedingly abundant at the Wareham Pond, and I took another pair *in copula*, as I did also on July 18th. On July 20th I took another pair and a single female at Wareham, and I made a similar capture on Knighton Heath on the following day. A chief feature on July 18th was the number of *pairs* observable in the late afternoon. I believe the great numerical preponderance of the male is more apparent than real. The females are far more difficult to see and follow up than the males, unless they are *in copula*. They are more likely also to be passed over as belonging to another species. Females, too, shelter far more than the males amidst the growth in and around the water or on the heath near it. When single females are disturbed as they rest, they shoot up suddenly, almost unnoticeably, to a great height, and are generally lost to pursuit. When wading to just within striking distance of pairs I noticed the females repeatedly free themselves, or become freed, and mount out of reach in a similar way. The species delights in very hot, bright, calm days. In cloudy weather not a sign of the insect will there be. Even the most diligent hunting through the vegetable growth in and around the water will not dislodge a single specimen, however many there may be about. Wind is not so unfavourable as cloud. Indeed, the completeness and suddenness of appearance and disappearance of an abundance of specimens, for part of a day or for days together under favourable or unfavourable conditions respectively, would always make me hesitate to say that the species was absent, at its proper season, from its haunts here, though it might be quite unseen.

It seemed to me that, as with some genera of Ephemeroptera, the same female would quit one male and afterwards unite with another. The first union—*per collum*—always appeared to take place over the water. The pair would then make for land, where fecundation would be effected, during which time the pair often remained settled. This is *the* moment for an easy capture of both. If undisturbed, the pair fly again over the water, once more united *per collum* only, and the female oviposits. At first she is still attended by the male, but afterwards the process appears to be continued without his further attendance. The female continually dips the tip of her abdomen below the surface, letting fall an egg, or eggs, here and there quite at random in the shallows, where a sprinkling of rush stems grows from the sandy bottom.

By mid-June the species had not appeared, and not an



individual was to be seen after a week of August. I fancy all British-bred imagines are practically confined to July, and are at their zenith just before the middle of that month, except perhaps in such exceptional summers as that of 1911. On the wing *S. fonscolombii* looks larger than *S. striolatum*, and many examples are as large or larger. Two of my Wareham males were slightly, and one much, affected with the characteristic red mite; the rest were free from this parasite. On all the dates examples varied much, especially the females, as regards the glassiness or suffusion of the wings. There was scarcely a single *S. striolatum* at the Wareham Pond in July, but in August, when *S. fonscolombii* was over, it became commoner. This fact quite gave an idea of antagonism between the species. They were always more equal in numbers at Knighton. The more lovely and majestic species hovers more constantly, evenly, and calmly low down over the water than does *S. striolatum*, and basks on the bare, sandy margins of its chosen pond, more warily perhaps, but in the ostentatious manner of *Pyrameis atalanta*. I quite came to the conclusion that its apparent extreme wariness was in fact largely due to restlessness, and, on one occasion at least, a bad shot at the male needed only to be followed by a patient motionless crouching at the spot, in order to effect a capture over the very place where the former stroke was made. The beauty of this dragonfly, when it is in numbers, is unimaginable.

On May 20th at Morden on the fir-surrounded swamps as many *C. ænea*, *B. pratense*, *Libellula quadrimaculata*, and *L. fulva*, Müll., could be seen and taken as would satisfy the most ardent collector. Especially easy of capture were they towards the end of the afternoon. I can say the same of *Anax imperator*, Leach, at West Knighton Pond on June 19th (when I took six specimens, including one pair *in copula*, two males at once which were toying together, and two singly, in an incredibly short time), and of *Orthetrum cancellatum*, Linn., at East Lulworth Pond on June 24th and 27th. The females of both these species appeared far rarer than the males. In fact, all but one or two of the species (such as *Æschna mixta*, Latr.) mentioned in my list of Dorset Odonata (*vide* Entom. xlv. p. 201) have been very common here this season. But again I have not taken *A. mercuriale*, nor have I been able to add to that list any fresh species, save *S. fonscolombii*, which I must have overlooked in 1911. Incidentally, I might mention that on one or two occasions in favourable autumns I have seen a specimen of *S. striolatum* as late as the beginning of December at Galton, and of *Æ. cyanea* at the end of November at Owermoigne. Mr. Hermann Lea has assisted me much in my quest of the Odonata of Dorset."





SYMPETRUM SCOTICUM ( $\times 4$ ).

Length about 16 mm.; breadth about 5.5 mm.

Drawn by W. J. Lucas from cast-skin, Black Pond, Esher Common,  
Surrey, July 18th, 1897.

DESCRIPTION OF NYMPH OF *S. scoticum*. (Plate VIII.)

General colour sepia, rather uniform in tint. *Length*, including anal appendages, about 16 mm., greatest *breadth* about 5.5 mm. *Head* transversely about 5 mm., less longitudinally, so that it appears somewhat narrow as compared with that of *S. flaveolum*, for instance; surface fairly smooth, and colour nearly uniform. *Eyes* prominent and well forward, somewhat conical in shape, and situated at the fore corners of the head. *Antennæ* of seven segments, basal one globular, the next cylindrical, the rest hair-like. *Labium* (mask) tapering backwards and reaching at the hinge to about the insertion of the mid legs, narrow at hinge, spoon-shaped, covering the face; palpi subtriangular, margins nearly entire with about twenty-four short spines at fairly regular intervals; middle lobe produced in a very obtuse angle, also bearing short spines; mental setæ about fourteen in each comb, lateral about eleven in each comb; moveable hook rather short and slender. *Prothorax* collar-like, rather broad, margined behind with a ring of hairs. *Mesothoracic spiracles* large and conspicuous. *Mesothorax* and *metathorax* fairly smooth and rather uniform in colouring. *Legs* long and slender; mid and fore tibiæ hairy, hind ones rather spiny than hairy; femora ringed with a rather indistinct distal darker band; length of fore legs about 9 mm.; of mid legs about 11 mm.; of hind legs about 14.5 mm. *Wing-cases* about 5 mm. long. *Abdomen* practically unicolorous; short mid-dorsal spines on the distal margin of segments six and seven; short lateral spines on segment eight, and rather longer ones on segment nine; ninth segment truncated behind, tenth rather small. *Anal appendages* small, pointed, surrounded by hairs; upper one triangular; laterals shorter and more slender; lower ones slender and longer than the other three.

*Material*.—Nymph-skins obtained while the insects were emerging at Esher Common, Surrey, and in the New Forest.

[Though it cannot be claimed as belonging to the British fauna, I might mention that I received from Dr. R. N. Goodman an example of *Æschna affinis*, which he took on board ship in the North Sea on July 7th, 1914.]

28, Knight's Park, Kingston-on-Thames.

## NOTES ON A FEW ICHNEUMONIDÆ FROM FIJI.

By CLAUDE MORLEY, F.Z.S., &c.

THE following species were contained in a small collection of insects from the west side of Viti-Levu, Fiji Islands, sent by Mr. R. Veitch to the Imperial Bureau of Entomology.

*Henicospilus apicifumatus*, sp. nov.

This species differs somewhat materially from *H. turneri*, Morl. ('Revision of the Ichneumonidæ,' i. pp. 49 and 51, 1912), in the darker flagellum, black ocellar region, immaculate anus, the lack of an apical alar corneous mark, the evidently more vertical (though



still distinctly antefurcal) lower basal nervure of the fore wing, the lower interception of the nervellus in the hind one, the shorter and broader brachial cell, the emission of the more bowed radial nervure much nearer the external cubital, but especially in the completely and distinctly subinfumate radial cell, which meets the subsinuate base of the radial nervure. Length, 15 mm. ♀.

The type is in the British Museum, together with a second specimen found during March, 1901, at Mackay, in Queensland.

*Echthromorpha diversor*, Morl.

*Echthromorpha* is an interesting and highly specialised genus, of wide distribution, ranging from St. Helena, through Africa, Mauritius, Ceylon, Assam, the Malay Archipelago, and Australia, to Fiji, whence both sexes of the present species, described as recently as 1913 ('Revision of the Ichneumonidæ,' ii. p. 47), from the Solomon Islands or New Hebrides have now been received. The female was hitherto unknown, but appears to differ only sexually from the male.

*Paniscus testaceus*, Grav.

One pair of this cosmopolitan species.

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A NEW SPECIES, BELONGING TO THE LASIO-  
CAMPIDÆ, FROM JAPAN.

BY A. E. WILEMAN, F.E.S.

*Crinoeraspeda* (?) *miyakei*, sp. n.

Antennæ plumose. Termen of all wings crenulate, costa of hind wings incised near base and before apex. Fore wings greyish brown, tinged with reddish brown beyond the middle; postmedial line black, inwardly oblique, angled towards costa where it is outwardly edged with white; area within postmedial line clouded with dark brown; venation black before the postmedial and brown between the postmedial and the pale, diffuse and irregular, subterminal line; terminal line dark brown, crenulate, fringes paler. Hind wings greyish brown, tinged with reddish brown on the median area, a short black bar extending from before middle of the costa to below the cell; terminal line and fringes as on the fore wings. On the under side the postmedial line is somewhat broader and edged with paler throughout its length; the black bar on hind wings becomes a band extending to dorsum, and is slightly angled about middle.

Expanse, 44 millim.

A male specimen, in rather poor condition, received from Professor T. Miyake, of the Imperial Japanese Agricultural College, Komaba, Tokyo. It was captured by Mr. Shiromma on July 3rd, 1908.

The species is closely allied to *excisa*, Wileman, from Arizan, Formosa, which was doubtfully referred to the genus *Crinoeraspeda*, Hampson ('Entomologist,' vol. xliii. p. 192).

## THE BUTTERFLIES OF THE BUCKS. CHILTERNs.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(Concluded from p. 122.)

## SATYRIDÆ.

36. *Pararge megæra*, L. Has become very scarce in the central region. Mr. Spiller reports it "quite gone from the North Chilterns."

Earliest seen, May 26th, 1900.

37. *P. egeria* var. *egerides*, Stgr. I have never found this butterfly as common in the beech woods of the central region as it is in the copses of the northern border of the county, where I have seen the spring brood swarming. But it seems to be well distributed from west to east—from the Wycombes to Wendover and away to Aston-Clinton. In my experience, however, it tends to disappear from the beech area. Professor Carlier includes *egeria* (i. e. *egerides*) in his High Wycombe list, and a little further east Mr. Spiller reports it common in 1914.

Earliest date seen, *gen. vern.*, May 11th, 1912, flying over and settling on dead beech leaves in sunlit openings; *gen. æst.*, first seen, July 2nd, 1908; last seen, September 12th, 1907. (October 3rd, 1914, A. J. Spiller.)

[*Hipparchia semele*, L. In Mr. Barrett's list of the butterflies of Buckinghamshire recorded in the 'Victoria County History,' there occurs the following passage (the italics are mine): "High Wycombe, and elsewhere, on rough chalky hillsides and open commons." I have sought diligently for the source from which this statement is taken, but without success. So far as I can ascertain, there is only one mention, and that a very doubtful one, of *semele* having occurred in the Chilterns; and I cannot believe that so careful a lepidopterist as Mr. Barrett would have made the statement quoted upon such slender evidence. In the 'Entomologist,' vol. vi. pp. 134 and 242 (1872), Dr. T. P. Lucas relates how one day in August, 1871, at Watlington (which is in Oxon., not Bucks.), he took one-third of the then recognized British butterflies. He does not mention *semele* among them on this occasion; but he says that he visited the same spot in 1872, where he met a gentleman (Mr. Spiller suggests it may have been the Rev. Mr. Bell, of Pyrton), who told him that he had taken *semele* that year, earlier in the season. If that, then, is the lonely authority on the subject, I fear it must be dismissed as insufficient. Neither my friends, nor I, who have scoured the chalk hills from end to end, have ever encountered the species. Mr. Peachell expressly excludes it from his MS. list for High Wycombe. Mr. N. C. Rothschild informs me that it is conspicuous only by its absence in the eastern Bucks. Chilterns. It would be highly interesting, therefore, to know whence Mr.

Barrett derived material for the record quoted. It may also be worth remark that as far back as the "fifties" Stainton gives no Bucks. localities, though Mr. South, in his 'Butterflies of the British Isles,' says that "it has long since been ascertained to occur in almost every county in England and Wales." That it should not favour the Chilterns is, therefore, astonishing.]

38. *Epinephele jurtina*, L. Always abundant throughout the summer.

Earliest seen, June 3rd, 1912; latest, September 27th, 1913.

39. *E. tithonus*, L. Generally distributed over the range.

Earliest seen, July 15th, 1889; latest, August 21st, 1913.

40. *Aphantopus hyperanthus*, L. I believe this butterfly is common on the foot hills in July, as I find plenty of wasted females in August. I have caught no aberrant forms, owing no doubt to my being absent at the normal time of flight.

Earliest seen, July 2nd, 1908; latest, August 21st, 1909.

41. *Cenonympha pamphilus*, L. Continuous from May to the end of September.

Earliest seen, May 2nd, 1912; latest, October 3rd, 1903.

42. *Melanargia galatea*, L. At the end of the nineteenth century it looked as if *M. galatea* had followed not a few of the reputed Chiltern butterflies to extermination. In the "sixties" it was reported well distributed in the eastern area. I have always hoped to re-discover it in these and other haunts once frequented; but though personally unsuccessful, having communicated a likely spot in the middle region to my correspondent, Mr. S. G. Castle Russell, I was delighted to receive a letter from him last year containing the much-desired news. Mr. Russell writes:—"On August 5th, 1913, I ascended high ground, and worked a very grassy slope on the right, the left side being wooded. About 200 yards further on the road dipped steeply, and on the right side the ground was fairly level, being the base of a shrub-sided hill, rather like Boxhill in appearance. On the other side of the road the ground sloped into a deep hole with woods at the end, and on this ground I saw two or three *galatea*. I noticed them particularly, because I remembered that in your article you had made remarks about their disappearance." At the western limit, in the neighbourhood of High Wycombe, Mr. Peachell reports that it occurs in several spots; but, as a rule, in small numbers. Mr. Spiller's account for 1914 is even more encouraging:—"Saw it in scores this summer on the Bucks. hills; very local, extending over five or six acres."

I have now come to the end of my Chiltern catalogue of butterflies. It is not as full in species as the bag of many a single day's collecting on the Continent. All the same, it will be seen that my correspondents and I have observed more than

two-thirds of the *Rhopalocera* of the United Kingdom within its limits; and when we include other butterflies known to inhabit the county, or observed in the past, the proportion becomes even more remarkable. In the woods that border on Northamptonshire, where also *Cyclopides palæmon* still exists, I have found *Leptidia sinapis* in plenty, and Mr. Kenneth Raynor includes it in his list of captures at Tingewick, on the Oxfordshire border (Ent. Record, vol. xxii. p. 45). I have alluded to the former occurrence of *Melitæa athalia*; and if *Euanessa antiopa* is to maintain rank as native of Britain, it is reported from Gerrard's Cross ('Entomologist,' vol. xxxiv. p. 293). A hundred years ago Lewin recorded *Lycæna arion* at Cliveden; Black Park, Stoke Poges, now partly golf links, was a popular locality for *Limenitis sibylla*. In his day the Rev. H. Harpur Crewe watched *Apatura iris* soaring above the oaks of Claydon, and there is no reason why it should not fly there still. But *arion* is no more than a legend and, with the Bucks. *sibylla*, has long since passed to the Elysian Fields. Let us hope that the opening up of the Chiltern hills will not compel the disappearance of other and more authentic indigenous species to the same delectable meadows!

Harrow Weald, Middlesex: March, 1915.

## NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### *Polia rantaizanensis*, sp. n.

♀. Head and thorax grey-brown, mixed with darker; abdomen paler grey-brown. Fore wings grey-brown, freckled with darker; subbasal line pale inwardly edged with black, not extended below median nervure; antemedial line pale, outwardly edged with black, wavy, indented above median nervure and again before dorsum; a black bar from lower end of subbasal line to the antemedial line, and a black mark on dorsal area before the antemedial line; orbicular and reniform stigmata pale grey-brown, the former outlined in black, the latter outlined in whitish and edged with black; a black cloud between the stigmata; claviform stigma outlined in black; postmedial line pale, serrated, inwardly edged with black; veins 2-4 dotted with whitish just beyond the postmedial; three whitish dots on the costa beyond the postmedial; subterminal line pale, indistinct towards costa where it is inwardly edged with black, wavy towards dorsum; terminal lunules black; fringes grey-brown mixed with paler, browner at base. Hind wings pale brown suffused with fuscous; fringes grey-brown, paler at tips, browner at base. Under side whitish suffused with fuscous; all the wings have a blackish discoidal dot and a postmedial line.

Expanse, 46 millim.



Collection number, 1502.

Three females from Rantaizan, May, 1909. There are specimens in the British Museum, also from Rantaizan (Wileman). The whitish dots on veins 2-4 of fore wings are absent in some specimens.

Allied to *P. pannosa*, Moore.

*Xylomania* (?) *confusa*, sp. n.

♂. Head and thorax pale brown mixed with darker, antennæ fasciculate; abdomen pale brown. Fore wings pale brown, costa marked with darker and with black; antemedial shade blackish, indistinct, marked with black; postmedial line blackish inwardly oblique, elbowed beyond end of cell; orbicular of the ground colour outlined in black; reniform outlined in black, enclosing an interrupted white crescent and central dot, set in a blackish patch; apical area clouded with blackish and obliquely marked with whitish brown; some black streaks between the veins connected with black lunules on termen; fringes pale brown chequered with darker. Hind wings whitish clouded with dark greyish on terminal area, veins brownish, discoidal spot black; terminal line black, interrupted; fringes white, dark grey towards tips. Under side whitish; fore wings clouded with brownish on apical area, discoidal spot and short interrupted line beyond black; hind wings have black discoidal spot and transverse series of dots beyond.

♀. Similar to male, but the medial area of the fore wings clouded with blackish.

Expanse, 27 millim. ♂; 29 millim. ♀.

Collection number, 1838.

One example of each sex from Arizan, March, 1908.

*Cirphis arizanensis*, sp. n.

Head and thorax pale brown, the latter slightly pink tinged; abdomen paler brown, dorsal tuft darker brown. Fore wings pale brown with slight pink tinge, shaded with darker under median nervure and along vein 5; a white dot at the lower angle of cell, median nervure marked with white; subterminal line represented by linear black marks on the veins. Hind wings dark fuscous, fringes whitish brown. Under side fuscous, hind wings rather paler and with traces of dusky discoidal mark and postmedial line.

Expanse, 38 millim.

Collection number, 1837.

A male specimen from Arizan, June, 1908.

*Cucullia* (?) *taiwana*, sp. n.

Fore wings brown, suffused with darker and faintly tinged with reddish and powdered with white; venation marked with black, black streaks, marked with white, between the veins on terminal area; five white dots on the costa towards apex; orbicular and reniform stigma partly outlined in white; terminal line black; fringes grey, ochreous at base, chequered with white at ends of the veins.

Hind wings whitish banded with dusky beyond the black discoidal lunule, terminal line black; fringes grey, ochreous at base, whitish at tips. Under side whitish powdered with greyish brown on margins, transversely clouded with blackish beyond the middle on fore wings; a black discoidal lunule and dusky line beyond on hind wings.

Expanse, 37 millim.

Collection number, 1835.

A male specimen and two females from Arizan, March, 1908.

*Elusa rufescens*, sp. n.

♂. Antennæ contorted before middle, bipectinated beyond. Fore wings brown tinged with rufous especially on the medial area; antemedial and postmedial lines black, the first excurved below median nervure and angled before the dorsum, the latter wavy; reniform stigma outlined in ochreous representing the figure 8, preceded by an ochreous dot; subterminal line pale, a few black scales along its inner edge, almost straight from costa before apex to the dorsum; terminal line black, interrupted; fringes brown. Hind wings fuscous brown, terminal line pale; fringes pale, darker at base. Under side of fore wings pale brown on basal two thirds, tinged with rufous on costal area, suffused with fuscous on terminal third; postmedial line blackish, diffuse about middle: of hind wings pale brown, tinged with fuscous; discoidal lunule, and curved series of marks on the veins beyond, blackish.

♀. Similar but fore wings clouded with blackish on the disc and the markings are indistinct; the rufous tint is confined to a streak along the dorsal area.

Expanse, 21 millim. ♂; 23 millim. ♀.

Collection number, 545.

One male specimen and two females from Kanshirei. The male taken August 18th, 1905, and the females, August 29th, 1907, and March 5th, 1909.

*Athetis confusa*, sp. n.

♀. Fore wings brownish white, dusted with brown; antemedial line brown, almost straight; medial shade brown, indented about middle; a dark dot in the cell and a rather larger and darker dot at outer end of the cell; postmedial line brown, wavy, excurved round cell, incurved below cell, very indistinct; subterminal line brown, undulated, indistinct; line on termen pale brown, dotted with black, fringes of the ground colour. Hind wings brownish white, suffused with fuscous, discoidal dot blackish, terminal line as on the fore wings. Under side whitish brown, discoidal dot on hind wings black; all the wings have a blackish postmedial line, that on the fore wings only distinct towards the costa.

Expanse, 27 millim.

Collection number, 966.

A female specimen from Kanshirei, July 23rd, 1906.

*Stictoptera (?) intermixta*, sp. n.

Head and thorax dark brown mixed with reddish brown and paler; abdomen grey-brown, dorsal tuft darker. Fore wings reddish brown clouded and suffused with darker; the terminal half of the wing, except beyond the subterminal line and below vein 2, is whitish clouded with reddish brown; basal area outwardly limited by a curved white band traversed by a slender, wavy, black line; the veins on this area are black; antemedial line black, wavy; two black lines not extending to the dorsum beyond the antemedial; postmedial line black, wavy, double, originating in a black mark on the costa; subterminal line blackish, black on the costa, preceded by blackish clouds towards the dorsum; terminal lunules black; fringes dark grey brown, tips marked with paler between veins. Hind wings termen bluntly angled below apex; fuscous brown with traces of darker discoidal lunule and three transverse lines beyond. Under side dark fuscous, costa of fore wings marked with white beyond middle; two darker transverse lines on the hind wings.

Expanse, 42 millim.

Collection number, 1683.

A male from Arizan, May, 1908.

*Eublemma terminimaculata*, sp. n.

♂. Head chocolate brown, antennæ brown with paired bristles; thorax whitish, whiter in front; abdomen pale brown, whitish at base. Fore wings grey sprinkled with brown, faintly pink tinged; antemedial line faintly indicated by black points; postmedial line brownish, excurved round cell, incurved below cell, angled before dorsum, traces of a somewhat similar line just beyond; subterminal line represented by an irregular series of black chevrons; terminal line and fringes brown, the latter whitish at base. Hind wings whitish grey, brown sprinkled; traces of irregular black-sprinkled brownish lines beyond the middle; terminal line and fringes as on the fore wings. Under side fuscous, powdered with darker; dorsal area of fore wings paler; traces of dark medial band in the hind wings.

Expanse, 22 millim.

Collection number, 1041.

A male specimen from Kanshirei, April 21st, 1906.

Near *E. poliochroa*, Hampson.

*Eublemma albipuncta*, sp. n.

♀. Fore wings ochreous brown powdered with darker brown; a dark brown patch at base of the costa, outwardly edged with black; a dark edged white mark at outer end of the cell, apical half of costa dotted with ochreous; antemedial line black, highly sinuous; postmedial line black, wavy and outwardly oblique, preceded on the costa by a brownish spot; subterminal line dusky, indistinct; terminal line black, interrupted; fringes ochreous brown chequered with darker. Hind wings whitish, suffused with fuscous, except fringes. Under side of fore wings fuscous, costa dotted with ochreous towards apex;

of hind wings whitish suffused with fuscous, powdered with brown on the costal area, discoidal dot blackish.

Expanse, 18 millim.

Collection number, 1038.

Two females from Kanshirei, April 19th, 1906, and April 9th, 1908.

Seems to come nearest to *E. brunnea*, Hampson.

(To be continued.)

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## THE REARING OF LARVÆ.

By C. RIPPON, M.A., F.E.S.

(Continued from p. 116.)

### CAGES.

For the successful rearing of larvæ, especially when fairly large batches are being dealt with, nothing is more important than to provide accommodation suitable to their particular habits. I should not like to say that it would be impossible to construct a cage with such internal arrangements that it could be adapted for larvæ of every different sort of habit, but I have never yet seen one; besides, it would probably be such a costly article as to be out of the reach of the ordinary entomologist. If we consider for a moment the different habits of larvæ, it is easy to realize why they require different sorts of houses in confinement. Larvæ which feed by day on bushes and trees want plenty of light and cages which are high in proportion to their length and breadth, while larvæ which feed by night on low-growing vegetation do best in a dark cage which is quite shallow in proportion to its length and breadth. Then there are others whose habits are best served by the use of tall dark cages, and still others by shallow light cages. The sun-loving larvæ, too, want special provision, such as many of the *Rhopalocera*, several of the "*Bombyces*," the *Cucullia*, &c. For these a cage must be provided which, while admitting the sunlight freely, must not get unduly hot in the interior.

My attention was first drawn to the advantages of using different types of cages some years ago. At the time I was using, apart from sleeves, only one form for what I may call ordinary larvæ, which consisted of a fairly high superstructure of glass and perforated zinc imposed on a sort of wooden box. With this type of cage I bred many different species with considerable success, but failed unaccountably with others that were not supposed to be difficult; amongst my failures were certain low-feeding *Noctuæ*, with which a friend of mine had no difficulty at all, although he could not rear some tree-feeding *Noctuæ*, which I found most easy. I discovered that he used almost



exclusively shallow and rather dark receptacles only ventilated at the top. I experimented with a shallow box, and thereafter found little difficulty in rearing such low-feeding Noctuæ. Then there are the night-feeding spring larvæ, which hide during the day but feed on the foliage of bushes and trees after dark. For these a fairly dark upright cage with plenty of sand and moss at the bottom is the best possible treatment. My friend, Mr. G. B. Coney, has devised an ingenious way of treating a wooden lard-tub so that it forms an ideal house for rearing such larvæ, and also for hibernating certain kinds of Noctuæ and Geometers.

It comes to this that anyone who desires to breed a large number of different species successfully should possess a great variety of cages, so that he can choose the one most suitable to the habits and food-plant of the species to be dealt with. There are, of course, many excellent cages—from the glass-topped metal-box to the glass cylinder type—sold by the various dealers, which are useful for the larvæ of many species; but to get the necessary variety it is almost essential to have also a number home-made. As already mentioned, flower-pots and small wooden tubs are most useful, jam-jars and cake-tins are not to be despised, and box-cages of all sorts and descriptions can easily be constructed by anyone who can handle a saw and a hammer, for the refinements of the carpenter or the cabinet-maker are quite unnecessary for the construction of efficient larva cages. A flat wooden box some six inches or eight inches in depth will make a splendid home for many of the low-feeding Noctuæ, if some perforated zinc is let into two of the sides and a lid of the same material is also provided. My own favourite cage for bush and tree feeding larvæ is of my own design, and consists of three parts: a plain box without a lid for the bottom; on this is imposed a framework of wood with two sides fitted with glass and two with perforated zinc, with a lid of the latter.

In referring to these home-made cages, I do not in the least wish to depreciate the value of the cages sold by the dealers; for instance, glass-topped metal boxes are practically indispensable; but most of us entomologists are not millionaires, and therefore we cannot afford to buy more than a few cages, however good they are. And my point is that a breeder requires to have a large assortment ready to hand to be really successful. Another question to consider in relation to cages is the most suitable size. This, of course, depends on the number to be placed in each cage. Quite early in my experience of larva rearing I noticed the curious fact that with many species, whether I started with three hundred young larvæ or only sixty, if I kept them together throughout, the number which pupated was generally about the same—somewhere between thirty and fifty. I tried, therefore, dividing the larger batches into two or more colonies according to their number, and I soon found that

I got my thirty to fifty pupæ from each colony; so that in the case of, say, three hundred young larvæ, by dividing them into five or six separate batches, I got nearly five or six times the number of pupæ I obtained by keeping them all together, even when I used an unusually large cage. Here again, however, it is impossible to lay down any law applicable to all cases; one species may be fed up in batches of seventy so easily that ninety per cent. will pupate, while with another species the batches must not exceed ten to twenty to obtain the best results. All this points to the fact that it is better to have a large number of small to medium-sized cages than a few very big ones. At the same time, there should of course be some large cages for dealing with really large larvæ, and other cages so constructed that they will take a good-sized flower-pot for those species which require to be fed or hybernated on the growing plant. I might here point out that, apart from cannibalism, larvæ of different species should on no account be kept in the same cage, if it can be avoided. Not only are the pupæ results almost invariably poor, but it also militates against the breeder obtaining any useful information about the habits and the special treatment of the different kinds.

I am fully aware that after a beating expedition a collector often obtains a miscellaneous assortment of odd larvæ which he has not the time or space to deal with separately. In such a case the larvæ should be carefully gone through and separated into three, four, or more batches, only putting together those which appear likely to have the same habits. I have still to refer to one of the most useful methods of treating tree and bush feeding larvæ, especially in their intermediate stages—and that is the sleeve. It requires, however, to be used with considerable caution when employed out of doors, unless the user is prepared entirely to cover in the trees and bushes with small-meshed netting. All sorts of birds make sad havoc with sleeves, particularly if they are made of muslin; tiffany is better and stronger, but even with that the larvæ are not quite safe; and if by chance they are left out until one or two begin to spin up in the folds of the sleeve, the likelihood of a bird raid will be greatly increased. Double sleeving is a greater protection, but does not add to the health of the larvæ in wet weather. I do not by these remarks mean to suggest that sleeving is to be avoided. Anyone who has a suitable garden would be foolish not to employ outdoor sleeving to some extent, for it is about the only way to treat certain species successfully. I only wish to emphasize the fact that it is not safe to sleeve a batch of larvæ in the open and leave them without any attention or protection till the foliage in the sleeve is consumed. They should frequently be inspected and watched, and should promptly be removed to a suitable cage as soon as they appear to be ap-

proaching the full-fed stage. Indoor sleeving is a most successful method of treating almost any larvæ—whose food-plant will allow of it—between the period when they get too big for a glass-topped metal box and their last instar. It is hardly necessary to add that larvæ which spin webs are not suited to this treatment. When I refer to indoor sleeving, I mean the simple process of cutting a small branch of the food-plant so that it has a fairly long stem; then sleeving the larvæ on the branch as if it were still on the tree, and placing the stem in a bottle or vase of water indoors. The reason I have described this method is that, though I have used it myself very largely for years, I have never yet met an entomologist to whom it was not a new idea; yet it seems to me a very obvious treatment and extremely useful, especially when away from home. The sort of sleeves I use for this purpose are fine muslin bags made in a variety of sizes, and so rounded that there are no corners.

(To be continued.)

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## NOTES AND OBSERVATIONS.

EUCHLOË CARDAMINES AT REST.—Near Oxshott on May 15th last I noticed a male specimen of the orange-tip (*E. cardamines*) at rest, late in the afternoon, on the top of an unfurled frond of bracken. Apparently it had taken up its position there for the night. On the swollen knob at the apex of the frond it was remarkably well protected by assimilation to it in colouring and mottling. Some years ago I came across a parallel instance.—W. J. LUCAS; Kingston-on-Thames.

DEILEPHILA LIVORNICA IN DEVON.—Mr. A. O. Rowden, F.E.S., of Exeter, wrote to me on May 11th last, saying:—"I had a specimen of the striped hawk-moth (*D. livornica*) brought to me on Saturday last (May 8th). It came to light in a house at Pinhoe, near Exeter, on the evening of May 7th. Unfortunately in capturing it my friend considerably damaged it as a specimen, but I have set what remains of it as well as I was able."—W. J. LUCAS; Kingston-on-Thames.

DWARF PYRAMEIS ATALANTA.—With reference to the small-sized *Pyrameis atalanta* recorded (*antea*, p. 124) by Mr. E. Rex. Phillips, it may perhaps be of interest to note that I have a specimen which, set in the usual style, measures exactly one and three-quarter inches in expanse. It was taken at Tunbridge Wells in the autumn of 1914 by Mr. W. J. Pitt-Pitts.—E. D. MORGAN; 24, Queen's Road, Tunbridge Wells, Kent.

PYRAMEIS ATALANTA IN MARCH.—At noon on March 7th last, the day being brilliant and unusually warm, I saw, and for about ten minutes observed close by me, a magnificent specimen of *Pyrameis atalanta*. The condition of the insect was so superb that it was difficult to believe it could have hibernated. I should add (1) that



the locality was an open space here in Exeter known as Bury Meadow, and (2) that I am induced by a well-known lepidopterist to send you this record.—H. MAXWELL PRIDEAUX; 20, Pennsylvania Road, Exeter, May 16th, 1915.

## RECENT LITERATURE.

## A REVISION OF SOME SPECIES OF EUCHLOË.

*A Preliminary Account of the Lepidopterous Fauna of Guelt-es-Stel, Central Algeria.* By WALTER ROTHSCHILD, Ph.D., F.R.S.

IN the 'Novitates Zoologicæ' (vol. xxi. pp. 299–357), October, 1914, there is an extremely interesting paper summing up the results of Lord Rothschild's investigation of the Central Algerian Lepidoptera. To collectors of palæarctic insects, however, it has a wider interest than faunistic, for incidentally the author clears up a number of obscure points in the nomenclature of the genus *Euchloë*, and for the first time arranges and classifies the spring and summer emergences of the many forms hitherto included under the typical *Euchloë* (*Anthocharis*) *belia*, Cram. Lord Rothschild now proves that Cramer assigned without authority the name *belia* to the green and white Anthocharid of the South of Europe, because the *Papilio belia* of Linnæus is really the Algerian *E. eupheno*, L., also a common Provencal insect in its European form *E. euphenoides*. The name *belia* falls therefore, and *ausonia*, Hübn. (1803) = *simplonia*, Freyer (1827)—“the alpine single-brooded subspecies”—becomes the name-type.

Lord Rothschild, adopting the trinomial form of nomenclature of the 'List of British Birds,' and dropping the “var.” altogether, then proceeds to arrange the species into two groups: the first, the single-brooded; the second, the double-brooded; the whole comprising twelve geographical races, and the respective spring and summer emergences, some of them named for the first time.

This classification I reproduce, so far as it relates to European forms, as I think it will be of special value to many of us who have taken the butterfly, or received it from collectors in its several European areas of distribution. I observe Lord Rothschild maintains the generic *Euchloë* throughout both for the “orange-tips” and the green and white Anthocharids of other systematists:—

## Group i.

- (1) *Euchloë ausonia*, Hübn. Alps, and E. Pyrenees.
- (2) *Euchloë ausonia oberthüri*, Verity. Western Pyrenees.

## Group ii.

- (3) *Euchloë ausonia crameri*, Butl.  
     gen. vern. *crameri*, Butl.  
     gen. æst. *alhambra*, Ribbe. } Spain (and N. Algeria).
- (4) *Euchloë ausonia esperi*, Kirby.  
     gen. vern. *kirbyi*, Rothsch.  
     gen. æst. *esper*i, Kirby. } C., and E. France.



- (5) *Euchloë ausonia matutia*, Turati.  
       gen. vern. *matutia*, Turati. } Riviera to Genoa.  
       gen. æst. *turatii*, Rothsch. }
- (6) *Euchloë ausonia romana*, Calberla.  
       gen. vern. *romana*, Calberla. } Tuscany, and C. Italy.  
       gen. æst. *romanides*, Verity. }
- (7) *Euchloë ausonia kruegeri*, Turati. }  
       gen. vern. *kruegeri*, Turati. } Sicily.  
       gen. æst. *trinacriæ*, Turati. }
- (8) Asia Minor.
- (9) *Euchloë ausonia græca*, Staud.  
       gen. vern. *græca*, Staud. } Greece, and Euxine.  
       gen. æst. *maxima*, Verity. }
- (10) Jerusalem (Palestine).
- (11) Egypt.
- (12) C., and S. Algeria.

Passing to the next species, hitherto known as *E. (A.) pechi*, Stgr., attention is drawn to the fact that Mr. Verity rightly associates this so-called species with *E. tagis*, of which it is the North African form. M. Oberthür, when he wrote the letterpress of the last magnificent fascicule (No. x.) of the 'Lépidoptérologie Comparée,' evidently had not before him the result of Victor Faroult's breeding experiments summarized by Lord Rothschild, which proves that the larvæ and pupæ differ not at all from those of typical *E. tagis*. Mr. Verity figured *pechi* ('Rhopal. Palæarctica,' pl. xxxvi. fig. 59) from a male, now in my own collection, taken by Miss Fountaine in company with Mrs. Nicholl at El Kantara in March, 1902 (*cp.* 'Entomologist,' xxxix. p. 87). She remarks that in the backward season of 1904 it did not put in an appearance until April 6th. Lord Rothschild further observes, to support the conclusion that *pechi* and *tagis* are forms of one species that, both in his own collection and in the British Museum, there are Spanish and Portuguese examples differing very little from true *pechi*.

Meanwhile, it is interesting to note that Lord Rothschild disagrees with M. Oberthür as to the specific identity of *Pieris (Pontia) raphani*, as might be expected, maintaining it, with the southern desert form *albidice*, Obthr., for the Algerian form of the familiar *P. daphidice*.

In conclusion, may I venture to ask our magazine contributors who record *Euchloë ausonia* and its forms to employ the nomenclature as tabulated. Errors corrected upon the unimpeachable evidence and solid reasoning which distinguish the work before us should not be repeated, even though they be the result of a century of misunderstanding. As a book of reference, Staudinger's 'Catalog' will continue to have its uses; but as time goes on, and specialists overhaul the various genera of Palæarctic Lepidoptera, it is seen that Staudinger's work teems with mistakes, sometimes due to sheer carelessness, not seldom to a lack of intelligent appreciation of the work of non-German scientists.

H. ROWLAND-BROWN.

Harrow Weald, Middlesex: April, 1915.

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## A SWARM OF BUTTERFLIES IN SARAWAK.

By J. C. MOULTON, F.E.S.

(Curator of the Sarawak Museum.)

ON January 10th a great flight of butterflies passed over the Museum grounds here in Kuching. I noticed several in the grounds between 1 and 2 p.m., but did not take particular notice of them until after 3 p.m., when I saw they were very much more numerous.

Seven individuals were caught; they proved to be *Cirrochroa emalea*, Guér (long known as *bajadeta*, Moore), a pretty chestnut-brown Nymphaline, on the wing not unlike our High Brown Fritillary in England. They all flew in the same direction, viz. to the west-north-west, keeping fairly low, i. e. low enough to be impeded by belts of trees, houses, &c.; at one spot I counted, roughly, one hundred and eighty pass over a fifty-yard stretch of path in four minutes—3.20 to 3.24 p.m. They began about 1 p.m. and lasted till 4 p.m.; with them was an occasional pair of *Euploea diocletianus lowi*, and once I saw a male *Papilio memnon* flying among them in the same direction, but I doubt if either species belonged to the swarm. Like myself, I expect they were out to see what was up!

The prevailing wind was N.N.W., but only very slight; the afternoon rather cloudy; the day generally somewhat cool after rain in the night.

My clerk told me they were not nearly so numerous this time as on a former occasion which the late Mr. Shelford describes.\* The interesting points about his record are: (i) that his swarm was noticed over exactly the same spot; (ii) within two days of the present record, i. e. on January 12th, not the 10th, but twelve years ago; (iii) it was the same species; (iv) flying in the same direction; and (v) Mr. Shelford notes that the north-east monsoon that year, October, 1902–January, 1903, had been particularly mild, only 39.45 inches of rain, instead of the average of 75.17 inches, having fallen.

This last year—1914—has been similarly a remarkably dry year, only 110.06 inches having been recorded instead of the average 160 inches; this low record is mainly due to the ex-

\* Journ. No. 39, Str. Br., Roy. Asiat. Soc. 1903, pp. 203–204.

ceptionally mild weather of the north-east monsoon, for only 29.2 inches fell in the last four months of the year instead of the average 55.5—a good parallel to that recorded by Shelford.

The year 1913, on the other hand, in Sarawak was nearly a record *wet* one, no less than 220.17 inches falling in Kuching.

This is the first time I have witnessed one of these extraordinary flights, which I had always pictured as a steady stream of butterflies pursuing an even course high over head and out of reach of earthly obstacles. But to me there was something almost uncanny in the way every single individual seemed blindly intent on going west. I watched them flying low over the cemetery, then suddenly they would find themselves brought up short by a belt of jungle; through it they went, in and out of trees, then out again for a short spell of plain sailing across the open grounds round the Museum; then another obstacle met them in the rather higher ground of the Residency gardens. A little further on a row of Chinese houses puzzled them; several flew into the verandahs, but that extraordinary sense of direction led them on. Shelford rather aptly describes them as like a heavy shower of falling leaves on a gusty autumn day in England. I imagine I did not see them in anything like the same quantity as he did, although to me the numbers were certainly astonishing.

Shelford's account differs from mine in one or two points. Thus he writes: "A bright westerly (*sic*) \* wind was blowing at the time, and the butterflies flew before it all over the town of Kuching towards Mt. Matang in a continuous flood for about fifteen minutes, whilst stragglers followed up in ever-decreasing numbers for the rest of the day."

He goes on to observe that "the swarm, or some part of it, arrived at Mt. Matang (ten miles west of Kuching) towards evening, and streamed up to the summit. At Sadong (twenty miles east of Kuching) the same phenomenon was witnessed at the same time on the same day as in Kuching, but whether this was a separate swarm or merely one of enormous size sweeping over the whole area between Sadong and Kuching it is impossible to say."

This suggestion of Shelford raises the question whether these swarms were strictly local, *i. e.* moving from one place in Sarawak to another not very distant, or did we observe a portion of a bigger "international" migration, say from Borneo to Singapore (five hundred miles due west of Sarawak)? I have no literature at my disposal to quote chapter and verse for instances of butterfly swarms seen at sea or migrating long distances; Darwin

\* He must have meant to write *easterly*, as he goes on to state the butterflies flew *before* it from Kuching towards Matang, which lies due *west* of Kuching.

records "vast numbers of butterflies, in bands or flocks of countless myriads, extended as far as the eye could range," when he was in the 'Beagle' some miles off the mouth of the Plata. Then there is Lyell's well-known account of *Vanessa cardui*, of which he writes\*: "A vast swarm of this species, forming a column from ten to fifteen feet broad, was in 1826 observed in Switzerland, in the Canton de Vaud; they traversed the country with great rapidity from north to south, all flying onwards in regular order, close together, and not turning from their course on the approach of other objects."

If our Sarawak swarms were migrating to the mainland, we may presume they would interbreed with their *emalea* cousins there. I should state, by the way, that the geographical distribution of *Cirrochroa emalea*, Guér. is South Tenasserim, Malay Peninsula, Nias Island, Sumatra, Java, and Borneo. In each of these countries slightly different forms are found, which some writers (Fruhstorfer in Seitz's 'Macro-Lepidoptera of the World' is the latest) name as distinct subspecies. That from Java (*bajadeta*, Moore), and that from Nias (*lupaona*, Kheil), appear to be well-separated geographical races, but the forms occurring in the Malay Peninsula, Sumatra, and Borneo are scarcely separable; and Fruhstorfer's subspecific distinctions seem to rest on very variable characters; the white discal fascia on the hind wing below, for instance, is very variable in a Sarawak series before me. If these migrating swarms are not strictly local, but wider migrations (and perhaps not infrequent) between the three countries—the Malay Peninsula, Sumatra, and Borneo—then we must look with more suspicion than ever on these particular subspecific distinctions.

It has long been noticed that the fauna of these three countries, for which I propose the collective name Neomalaya, has a remarkable number of species in common compared with the fauna of the neighbouring island of Java, which shows a closer relationship in some ways to the fauna of Eastern India than it does to these three much nearer Malayan countries. The explanation of this is that Java has been separated as an island for a very much longer period, while the other three countries have formed one continuous land-mass at a more recent period. But, on the other hand, each of these three countries has been separate for a sufficiently long period to develop quite a respectable endemic fauna for itself; so that it is a little difficult sometimes to account for the similarity of individuals in the three countries on the geological explanation alone. Especially is this the case when everything points to the species being peculiarly liable to develop local but constant variations. I suggest that migration plays a bigger part than we are apt to remember in

\* 'Principles of Geology,' vol. ii. p. 381 (12th edition 1875).



the formation of faunistic characters (and in the concealment of those we should expect to find).

Shelford notes that on the following day "another fighting was noticed in Kuching, but the numbers were infinitesimal compared to those flying on the 12th, and they did not attract the attention of many observers." On the present occasion similar swarms were noticed on the two succeeding days, all wending their way on the same west-north-westerly direction. Shelford further notes that out of eighteen specimens captured on January 12th, 1903, thirteen were males and only five females. On the third day of fighting this year (January 12th, 1915), we caught between forty and fifty, and the sexes were almost evenly divided. At the moment of writing (twelve days after) the species has not been noticeable in Kuching until this afternoon, when my wife called my attention to their presence again. As before, they were flying in similar numbers in the same direction. Shelford, on the other hand, states that in 1903, "a month after the swarm was observed, this species is quite the most common met with in and around Kuching, but now nearly all the specimens captured are females." Two other very similar species are not uncommon in Sarawak—*C. tyche*, Feld., and *C. malaya*, Feld.—and in flight I doubt if the three species could be distinguished. Of the fifty specimens captured on this occasion all were *C. emalea* except two, one of which was a male *C. tyche*, the other a male *C. malaya*. Some authors have regarded this last species as a dry-season form of *emalea*, but collecting in Sarawak does not support this, and I think *malaya* is quite a good species. The presence of these two strangers may be due to the same reason which drew the *Euplaea* and myself, namely, Curiosity!

There are two more Cirrochroas in Sarawak—*C. satellitia*, Butl. and *C. orissa*, Feld.—but both are more distinct and could be recognised on the wing. I saw none of them in this swarm.

The local Chinese regard the swarms as an evil portent, and they say that sickness will fall upon the land this year. It is true that cholera was bad in Sarawak in 1903, the year of Shelford's swarm, but in 1902 it was infinitely worse.

January 25th.—Fine morning and slight wind from the north; the flights of *C. emalea* noted yesterday afternoon continue again to-day, beginning at 11 a.m., just as numerous as before, and flying now, as I write (2.25 p.m.), in the same west-north-westerly direction.

I have anxiously looked out for any signs of attacks by birds, but have failed to see any. To a sporting insect-eater this profusion of butterflies should be tempting, though I expect they would take some catching.

Sarawak: January 25th, 1915.

## BUTTERFLIES OF THE OXFORDSHIRE CHILTERNs.

By THE REV. J. W. BUSSEY BELL, M.A.

I HAVE been much interested by Mr. H. Rowland-Brown's articles in the 'Entomologist' on the "Butterflies of the Bucks. Chilterns." For the past five and twenty years, during which, up to August last, I was Vicar of Pyrton in the close neighbourhood of the Oxfordshire Chilterns, I have collected and carefully listed the Macro-Lepidoptera within a radius of five miles of my Vicarage. My best hunting-grounds for butterflies have been the gullies of the hills not many miles removed from the Buckinghamshire border. It occurs to me therefore that my notes of captures may be of some interest.

*G. rhamni*.—Abundant both before and after hybernation. The food-plant of *Rhamnus catharticus* is common on the scrub-covered portions of the hills.

*C. edusa*.—A few isolated specimens observed nearly every season. It was fairly common in clover fields in 1892, and again in 1900, in both which years specimens of *ab. helice* were observed.

*C. hyale*.—Also occurred in the district in 1892. I did not myself procure it, but an old pupil, now Dr. Clare Wiggins, F.E.S., took six in the neighbourhood of Watlington. In 1900 it was far more common along the foothills than *edusa*, and I took as many specimens as I wanted with ease. In the following year I observed three on different occasions, and in 1902 a solitary one. All these were in or after the month of August. I never encountered a first brood specimen.

*P. brassicæ*, *P. rapæ*, and *P. napi*.—All common in the district.

*E. cardamines*.—Common in all favourable springs. I think I note a preponderance of females about the hills.

*M. gulatea*.—Twenty years ago the metropolis of the species appeared to be situated in one hillside field near the top of Watlington Hill, where they are still to be found in plenty, but from there they have spread for a mile or more along the slopes on either side where I never used to meet with them in early collecting days in the neighbourhood.

*P. egeria* var. *egerides*.—Common on the edges of the hillside beech woods.

*P. megæra*.—Quite scarce along the hills, rather more common a mile away on the plain, but nowhere abundant in the district.

*H. semele*.—Very scarce indeed. I have not seen one since 1898, and the only local specimen I possess was caught and given to me by Dr. Wiggins many years ago.

*E. tithonus*.—Abundant along the hedgerows at foot of hills.

*A. hyperanthus*.—Common at edge of woods on hills.

*C. pamphilus*.—About the commonest of our hill butterflies.

*P. cardui*.—A few hybernated specimens and also autumn brood encountered most seasons, but I have never known it abundant, nor have I ever found the larva, though I have searched for it.

*P. atalanta*.—Usually common in gardens in autumn, and I have not unfrequently come across spring immigrants.

*V. io*.—Formerly quite a scarce insect, but grown more common of late years, broods of larvæ being now not infrequent on nettle patches by field path from Watlington to Pyrton.

*E. antiopa*.—I had the luck to capture a specimen in perfect condition on a post sugared for moths in my garden at Pyrton Vicarage on August 19th, 1900. The specimen is now in the University Museum at Oxford. There were, I think, about a dozen recorded captures in England that year.

*E. polychloros*.—A brood of larvæ stripped the branch of a wych elm overhanging my garden at the Vicarage some ten or twelve years ago (I have not the exact date). I was unfortunately away from home when they descended, but luckily found half a dozen of the pupæ on the wall of a neighbouring shed in the garden, which produced fine specimens. Since then I have on several occasions at rare intervals seen isolated specimens on the wing about the hills.

*A. urtica*.—Common everywhere.

*P. c-album*.—September 23rd, 1897, a solitary individual visited the Vicarage garden. Unfortunately it departed while I was fetching my net, but not before I had inspected it at close quarters, sunning itself on a flower. I could not be mistaken in my identification, as I am quite familiar with the insect, which is common about my boyhood's home in Worcestershire. The wild hop grows in the hedges hereabouts.

*D. paphia*.—Common in favourable seasons, but not every year, in a gully. This gully, the gently sloping sides of which are clothed with oak scrub, flanked at the top by beech wood, is the most prolific ground in the neighbourhood both for insects and flowers.

*A. adippe*.—Common in the above locality. Contrary to Mr. Rowland-Brown's experience I find it far more abundant than *A. aglaia*, which occurs but sparingly there and in neighbouring parts of the hills.

*B. selene* and *B. euphrosyne*.—Both fairly common at Greenfield and other gullies on the hills.

I have never met with or heard of *M. aurinia* or *M. athalia* in the district.

*H. lucina*.—Fairly common in gully between Shirburn Wood and Pyrton Hill and other similar localities.

I have never met with *Z. betulæ*. As regards *Z. quercus* in the district, I have been surprised at its absence from Greenfield Scrub, which much resembles localities in other parts of England where I have found it abundantly.

*T. v-album*.—Up to three years ago I used to find this butterfly regularly about the second week in July in abundance in a particular spot in Greenfield Scrub. Acres of ground there are covered with a jungle of rose bay, *E. angustifolium*. At this particular spot a few dwarf wych elms grew by the path, on which the larvæ undoubtedly fed, the imagos sunning themselves on the flowers of the *Epilobium*. Some three or four years ago some miscreant cut down the elms, and the butterflies seem to have totally disappeared. I have seen a stray specimen or two in Pyrton Vicarage garden, and heard of them at a

place near Tetsworth, about four miles off. But the butterfly is certainly extremely local in its occurrence about here.

*C. rubi*.—Common about the edges of the hill woods.

*C. phlæas*.—Generally common.

*C. argiolus*.—Fairly common in most springs about holly trees and in gardens, also a few specimens at bramble of the second brood; unusually abundant last year (1914).

*C. minimus*.—Common in Watlington Gully above the chalk-pit. A few met with in other hill localities.

*P. corydon*.—Met with in profusion every year in Watlington Gully, and other like places about hills.

*P. bellargus*.—My experience of this butterfly is remarkable. For years I searched for it in vain. At length, in 1899, in looking over a box of insects caught by a son of the late Mr. R. Peel (then living in the house on Pyrton Hill which I now inhabit), I saw three unmistakable specimens. Eagerly enquiring place of capture, the boy said, "Why! they are all over the hill." (That was late in August.) Needless to say I kept my eyes open on my way home, and, sure enough, there were several *adonis* (*bellargus*) on the wing. Next day I came with a net and captured half a dozen. I could have taken more, but, finding them already somewhat worn, left them in the hope of a brood in the following year. Now a point to note is that I was in the habit of crossing that particular hill at least once a week in the ordinary course of my parish work, and had the parents of this autumn brood been there in the spring I do not think I could have failed to notice them. It appeared to be a clear case of an autumn migration. Naturally in the following year, 1900, I was on the alert. The butterfly occurred in fair numbers, both spring and autumn broods, in that locality and others distant a mile away. After 1900 it disappeared, and has never, to my knowledge, appeared again. Why it failed to establish itself permanently is a mystery to me, as its food-plant, *Hippocrepis comosa*, is fairly common in the places where the butterfly was taken, and, as our hills are not grazed by sheep or cattle, there would be no risk of destruction of the brood from that cause.

*P. icarus*.—Common everywhere.

*P. medon*.—Fairly common all over the hills.

I have not met with *P. ægon* in the district.

*H. malva*, *N. tages*, *A. flava*, *A. sylvanus*.—Common in the gullies. (I have not detected *lineola*.)

*A. comma*.—Sparingly taken in Watlington and Pyrton gullies. Appears to be rather local.

Pyrton Hill, Watlington, Oxon: May, 1915.

## NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### *Corgatha tornalis*, sp. n.

♂. Head, thorax and abdomen pale reddish brown, the latter marked with blackish except on basal segments. Fore wings pale reddish brown, costa blackish on basal two-thirds, a white dot on the



costa beyond the middle; traces of a black antemedial line, only distinct towards dorsum; a large blackish blotch on tornal end of terminal area; postmedial line blackish inwardly edging the tornal blotch, represented by black dots on the veins towards costa; sub-terminal line blackish, only distinct between veins 4 and 6; terminal line black, crenulate, preceded by black dots between the veins; fringes reddish brown, marked with black between the veins. Hind wings reddish brown, a blackish tornal patch; terminal dots black. Under side rather paler than the upper side; all the wings have a black discoidal dot and transverse line beyond; the terminal area of fore wings clouded with blackish.

♀. Similar but transverse lines on the fore wings more distinct, and there is a blackish lunule on these wings.

Expanse, 24 millim. ♂; 26 millim. ♀.

Collection number, 980.

One example of each sex from Kanshirei; the male taken in July, 1906, and the female in August, 1907.

Near *C. castanea*, Hampson.

*Erastroides limbata*, sp. n.

♀. Head and thorax dark brown; abdomen whitish, mid segments tinged with brown. Fore wings brown, powdered with darker, and clouded with blackish on basal three-fourths; terminal fourth whitish, transversely clouded with blackish; postmedial line black marked with pale brown, turned in under cell thence wavy to dorsum, limiting the paler terminal area; terminal line black, indistinct except towards apex where it unites with a black spot. Hind wings fuscous grey, fringes preceded by a pale line. Under side fuscous; apex of the fore wings black, intersected by the veins and limited by a diffuse whitish line.

Expanse, 19 millim.

Collection number, 1277.

A female specimen from Kanshirei, April 9th, 1908.

*Lithacodia viriditincta*, sp. n.

♀. Head whitish, thorax (rubbed) apparently greenish; abdomen whitish, segments barred with greenish grey. Fore wings whitish, suffused with green, a black mark at base of the costa; antemedial line black, not continued to dorsum, forming the inner boundary of a large quadrate black patch on the medial area; orbicular stigma of the ground colour, united with a similar spot on the costa and with another below the cell, all these spots enclosed in black patch; reniform stigma of the ground colour but not well defined; post-medial line black, wavy, only distinct from costa to vein 3; sub-terminal line black, originating in a conspicuous spot on the costa, thickened about middle; terminal line black, interrupted at ends of the veins; fringes grey, brownish at base, traversed by darker grey. Hind wings greyish suffused with brassy yellow on terminal two-thirds; two dusky wavy lines beyond the middle, the inner one most distinct; terminal line black, interrupted at the veins; fringes as on the fore wings but somewhat paler. Under side whitey brown; fore

wings clouded with fuscous; hind wings have a dark discoidal spot and transverse line beyond.

Expanse. 30 millim.

Collection number, 1834.

A female specimen from Arizan, June, 1908.

Allied to *L. aurata*, Moore.

*Lithacodia taiwana*, sp. n.

♂. Fore wings pale brown, powdered with darker brown thickly on basal half and terminal fourth; costa marked with whitish brown; antemedial line dark brown, sinuous, indistinct; two pale-edged dark dots at outer end of the cell; postmedial line dark brown, outwardly pale edged, wavy, curved round cell, indistinct; terminal line black, dotted with pale brown at ends of the veins; fringes dark brown, paler mixed. Hind wings dark fuscous, terminal line pale brown; fringes greyish, darker at base. Under side of fore wings pale brown suffused with fuscous on the disc; of hind wings whitish brown, powdered with darker brown chiefly on the costal area.

♀. Fore wings less thickly powdered with dark brown; transverse lines more clearly defined, the antemedial inwardly pale edged; a dusky wavy line before the postmedial line.

Expanse, 19 millim. ♂; 23 millim. ♀

Collection number, 1030.

A male specimen from Kanshirei, June 10th, 1906. The female type, with two other specimens, all from Kanshirei (Wileman), is in the British Museum.

*Bryophila* (?) *nigrescens*, sp. n.

♀. Head and thorax blackish mixed with whitish; abdomen fuscous grey. Fore wings blackish, finely powdered with whitish especially on the terminal area; white dot on the costa towards apex; antemedial and postmedial lines black, wavy; the postmedial is interrupted and excurved beyond the cell; reniform stigma outlined by white dots; subterminal line represented by black dots, terminal dots black; fringes white mixed with dark grey. Hind wings blackish. Under side of fore wings brownish suffused with fuscous and clouded with blackish on terminal area; of hind wings whitish, sprinkled and suffused with fuscous; traces of a dusky transverse line beyond the middle.

Expanse, 28 millim.

Collection number, 1839.

A female from Rantaizan, May, 1909.

*Chytonix costimacula*, sp. n.

Head pale grey, collar dark brown; thorax and abdomen pale grey, the latter with a brown mixed dorsal tuft and some brown hairs in the anal tuft. Fore wings whitish suffused with greyish, basal patch black, indented on outer edge, connected along dorsal area to the postmedial line; a black spot about middle of costa; postmedial line black, outwardly oblique but indistinct towards the costa, sharply

bent inwards below vein 2 thence straight to dorsum one-third from tornus; terminal area clouded with dark greyish except towards tornus; fringes dark greyish, paler marked at ends of veins. Hind wings fuscous grey, paler on the basal area; discoidal spot blackish; fringes pale grey traversed by a darker line. Under side whitish powdered and clouded with fuscous; all the wings have a blackish postmedial line preceded by a blackish spot; on the fore wings the spot is costal and on the hind wings discoidal.

Expanse, 26 millim.

Collection number, 1404.

A male specimen from Kanshirei, April 19th, 1908.

*Chytonix melanoleuca*, sp. n.

Head and thorax whitish marked with brown; abdomen whitish powdered with brown. Fore wings whitish finely sprinkled with brownish atoms; a dark spot at base of the costa; antemedial and postmedial lines black, the former nearly straight but indistinct near costa, the latter wavy and incurved above dorsum; medial line black, wavy; antemedial line followed by a dusky patch on the costa which joins with a similar patch on the dorsum before postmedial line; a small dusky cloud at outer end of cell, a similar cloud on costa before apex, and another dusky cloud on termen between veins 4-5; terminal line blackish, interrupted. Hind wings whitish, finely sprinkled with brown; discoidal spot and terminal line black, the latter interrupted. Under side whitish suffused with fuscous on the fore wings; all wings have a black discoidal spot and an interrupted terminal line.

Expanse, 35 millim.

Collection number, 1877.

A male specimen, in poor condition, from Rantaizan, May 17th, 1909.

Allied to *C. nigribasalis*, Hampson.

*Earias punctaria*, sp. n.

♂. Head and thorax green inclining to yellow in front; abdomen whitish. Fore wings green, costal area to postmedial line inclining to yellowish; a reddish dot in the cell and two others beyond it—one above the cell the other below the cell; a reddish brown spot at outer extremity of the cell; postmedial line dark green, turned in towards costa and angled towards dorsum; subterminal line dark green, indented above the middle; terminal line dark green; fringes green, tips brownish, entirely brownish at apex. Hind wings whitish, tinged with yellowish at apical end of the fringes. Under side whitish, fore wings green tinged and with traces of reddish brown spot at outer extremity of the cell.

Expanse, 26 millim.

Collection number, 968.

A male specimen from Kanshirei, April 27th, 1908.

Near *E. angulifera*, Walk.

*Zethes nigrilineata*, sp. n.

♂. Head and thorax reddish brown, dusted with darker; abdomen greyish brown. Fore wings reddish brown, sprinkled with darker; antemedial line black, twice angled towards the costa, excurved towards dorsum, inwardly whitish edged on costa; postmedial line black, double, inwardly oblique, angled below costa; a large creamy white spot and four white dots on the costa beyond the postmedial line, the fourth dot at apex; subterminal line black, slender and wavy below middle, incurved and thicker towards apex; terminal dots black. Hind wings rather paler, inclining to ochreous brown; antemedial line black, appearing to be a continuation of the postmedial of the fore wings; a pale edged wavy black line just beyond. Under side pale brown, the fore wing clouded with fuscous; all the wings have two blackish traverse lines beyond the middle.

Expanse, 26 millim.

Collection number, 991.

A male specimen from Kanshirei, April 16th, 1906.

There are two specimens, also from Kanshirei (Wileman), in the British Museum.

Allied to *Z. ornata*, Leech.

*Zethes (?) parallela*, sp. n.

♂. Head and thorax brown, pink tinged; abdomen whitish dusted with grey brown above, except at the base and the segmental divisions; antennæ minutely ciliated. Fore wings pale brown dusted with darker and tinged with pink; antemedial and postmedial lines whitish, outwardly edged with dark brown, oblique, parallel; medial line pale, edged with dark brown, slender, zigzag; terminal dots black. Hind wings pale brown dusted with darker and faintly pink tinged; two outwardly dark edged pale lines beyond the middle, the first inwardly oblique, the other somewhat wavy and indistinct towards the costa; terminal dots black. Under side whitish brown; hind wings rather paler, with traces of a dusky discoidal mark and a line beyond.

Expanse, 28 millim.

Collection number, 1414.

A male specimen from Kanshirei, May 18th, 1908.

*Egnasia inconspicua*, sp. n.

♂. Head and thorax dark brown; abdomen pale brown, heavily dusted with dark brown above. Fore wings pale brown, inclining to ochreous, dusted and clouded with dark brown; costa dark purplish brown; dotted with ochreous towards apex; antemedial and postmedial lines dark purplish brown, wavy, angled below costa; postmedial line, which is outwardly edged with whitish, approaching antemedial line on dorsum; a patch of pale scales on dorsal area between the ante- and postmedial lines; subterminal line indicated by white dots on the veins, only distinct on 6 and 7; terminal line dark purplish brown, crenulate; fringes ochreous brown. Hind wings pale brown inclining to ochreous, suffused and clouded with



darker brown; traces of a diffuse, dusky, antemedial line; postmedial line, which appears to be a continuation of that on fore wings, dark purplish brown outwardly edged with whitish; faint traces of an ochreous subterminal line, with blackish marks on it towards dorsum; terminal line and fringes as on fore wings. Under side of fore wings ochreous freckled with brown; discoidal lunule whitish partly edged with dark brown, a clear ochreous spot below it; antemedial line brown, curved, diffuse; postmedial line dark brown outwardly edged with whitish, angled below costa; subterminal line indicated by white points on the veins; hind wings paler, antemedial and postmedial lines as above, discoidal mark pale united with antemedial.

♀. Head and thorax darker than in the male. Fore wings heavily suffused with deep brown almost blackish, the transverse lines are similar to these characters in male, but the angle of postmedial is more acute, the subterminal is more distinct, the scales of the patch on dorsal area are bluish white, and there is an ochreous spot above the patch; discoidal mark represented by two whitish dots. Hind wings suffused with deep brown and dusted with bluish white; transverse lines as in the male, but subterminal more distinct. Under side suffused with brown, markings as in the male.

Expanse, 26 millim. ♂ ; 34 millim. ♀ .

Collection number, 535.

One example of each sex from Kanshirei, the male captured on August 17th, 1905, and the female on April 26th, 1908.

Allied to *E. castanea*, Moore.

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## THE REARING OF LARVÆ.

By C. RIPPON, M.A., F.E.S.

(Continued from p. 150.)

### SPACE.

WHEN a number of larvæ are being reared, the question of what space should be allowed them depends on such a number of conditions that it is very difficult to generalise. As a starting point, let us say that for average Noctuæ larvæ of the size of *N. brunnea*, *N. triangulum*, or *Aplecta nebulosa* not less than 25 to 30 cubic inches per larva should be allowed when in their last skins, i.e. a cage measuring 16×7×10 in. would accommodate about thirty-five larvæ. This, of course, refers to a cage of wood, metal, or glass, well ventilated on sides and top with perforated zinc or other similar material. More larvæ of the same size could with safety be put in a muslin sleeve of the same capacity. Of course, large species require a great deal more room; the bigger hawks should be given quite sixty cubic inches per larva. Smaller larvæ, again, do not require anything

like so much space; indeed, I have bred through from ova to pupæ quite a number of the small Geometers in glass-topped metal boxes throughout. Only last year I was quite successful with a number of *Eulype hastata* larvæ so treated, about twelve to a  $3\frac{1}{4}$  in. box. I do not suggest that that is the best sort of house for larvæ so large, but simply quote it to show what can be done in that direction. As already mentioned, it is most difficult to generalise as to space; the individual habits of larvæ of different species make so much difference. Gregarious larvæ, for instance, such as *Malacosoma neustria*, require little space—at any rate, until they separate. Also *Lymantria monacha* and *Dasychira pudibunda* and some others stand a great deal of crowding without hurt; whereas, on the other hand, soft fleshy larvæ, and particularly any species which tend to cannibalism, require a lot of room. Larvæ which are found in nature much separated, such as one to a plant, should be treated liberally in the matter of space; while larvæ which are found several together will generally stand more crowding. In dealing with larvæ whose habits are unknown it is always best to give as much room as can possibly be managed.

#### PUPATING MATERIAL.

The choice and condition of the pupating material most suitable to the species being bred is a matter of considerable importance. I have known some quite experienced entomologists who acted on the principle that ordinary garden mould was all that was required for any larvæ which went underground for pupation, and then complained that certain species were very difficult to get to pupate. Now garden mould varies enormously; mould from one garden might be nearly all clay, while that from another not half a mile away would be nearly all sand. Apart from that, however, some larvæ require quite a special type of material, while the majority do best in a light, fibrous, sandy sort, more analogous to pure leaf mould, and very different to the ordinary soil in any garden. Then, again, for convenience in manipulation the material should have nothing in it which could be mistaken for a cocoon, *i. e.* no lumps, stones, &c.; it should also be easily able to be moistened to any degree required, and, most important of all, should be free from any insect pests. Coconut fibre is an almost ideal substance in certain ways, especially when it can be used without treatment; but the worst of it is that it is liable to be infested with insect pests, and if raised to a high temperature to kill these it becomes tindery and is then apt to be very dusty when dry, and sloppy and unpleasant when moistened. Well-matured, soft, brown peat rubbed up fine, passed through a sieve, and mixed with a little fine silver sand, makes a compost that will suit quite nine-

tenths of burying larvæ. It can also be moistened easily, and to almost any degree, without becoming lumpy or sloppy. This moistening is a very important matter with many species; some larvæ, indeed, seem quite unable to go down in anything at all dry, simply crawling about and rolling on it till they shrivel up and die. For most species it is best to moisten the compost just enough so that when lightly pressed down a pencil can be pushed into it and withdrawn without the hole immediately filling up.

There are, of course, species which require the compost to be much wetter, such as *Noctua stigmatica*. The larva of this moth does not pupate for a long time after going down; and during this period the compost in which it has buried requires to be kept quite wet, otherwise the larva is liable to shrivel up and die. Then there are other species with which dryness seems necessary for real success, as with some of the *Cucullia*. It was a long time before I found out how it was that in breeding *C. lychnitis* I got such a small proportion of pupæ in comparison with the number of larvæ which went down. Thinking the matter out I realised that one of my best places for finding *lychnitis* larvæ in nature was a spot where at that time of year there was nothing but the driest of material to pupate in. I therefore decided to try these larvæ with something absolutely dry, and, as anything peaty would be dusty in that condition, I gave the next batch of *lychnitis* pure dry silver sand with admirable results, and have had no difficulty since in getting the larvæ to pupate.

Of course, there are other materials preferred by different species; I have known *Dasypolia templi* to pupate in a sloppy mess of chewed carrot, while others seem sometimes to prefer their own frass. Then there are the seashore larvæ that should be given sea-sand. In that connection I may mention what I believe to be a rather important point with reference to those larvæ which bury in a dry substance like sand, and make no appreciable cocoon, and that is, that the receptacle in which they have gone down should on no account be subsequently jarred or shaken. Once when on a visit to a friend who lived close to the sea, and was generally a successful breeder, he enlarged on how difficult he found it to breed *Agrotis ripæ*, and said that he had come to the conclusion that they went very deep for pupation. On that account he had tried drain-pipes full of sea-sand, but even they did not seem to be deep enough. Judging from where he kept his larvæ, I thought it possible that the real reason of his non-success was that his receptacles got jarred, so that the larva, not making anything more than a sort of pocket to rest in, was smothered by the sand falling in on it, when in its almost helpless state of resting prior to pupation. I therefore collected some *ripæ* larvæ, filled a large biscuit tin with



sea-sand, and when I got home (near the centre of England) I gave the larvæ about 8 in. of sand in an old lard bucket, and when they were finishing feeding placed it where it would not be moved or shaken. The next summer I bred quite a nice little lot of *ripæ*, and further found that some of the pupæ were not more than two or three inches below the surface. Of course my success in this instance may have been due to some other cause, and, not living near the sea, I have not had much opportunity of experimenting frequently with seashore larvæ; but judging from experiences with other larvæ of similar habits, I think the success was largely attributable to the absence of shaking.

While speaking of receptacles for pupating, it may be mentioned that, though metal may be used, those constructed of rough wood are infinitely preferable, except for wood-eating larvæ and one or two species who seem to like stone or earthenware to pupate on. The size and depth of the receptacles are again dependent largely on the species to be treated. About three or four inches deep are sufficient for the majority of burying larvæ, but for some of the large hawks and certain fastidious things such as *Apocheima hispidaria*, the compost should be much deeper. I lost a nice lot of the last-named once through giving them too shallow a pan and allowing too many to pupate in it. I believe only about ten to fifteen per cent. of the larvæ succeeded in turning properly into pupæ. As to size of receptacle, it is far better to have a number fairly small, and let only a few larvæ go down in each than one large one, and expect a lot of larvæ to go down in it. One reason is that generally the majority of a batch of larvæ unaccountably prefer one end or corner of a pupating box; consequently, if a large number are allowed to pupate in the same box, however large it may be, those which descend last will disturb those already down, with bad results as to the number of pupæ obtained.

For larvæ which spin up on the surface of the ground there is nothing to equal natural moss (sterilized) pressed down gently on to the surface of a layer of the peaty compost already described. For those which spin up in dead leaves it is obvious what should be supplied, while larvæ which spin above ground usually do not require anything special, but will make their cocoons on the food-plant or cage. With such species as *Arctia caja*, however, it is advisable to give a handful or two of wood-wool, so that the majority may spin up in that instead of making a general mess of the top and sides of the cage. The *Dicranura* require the bark of the trees they feed on to make the best job of their cocoons, but ornamental cork is not a bad substitute, while the wood feeders, one or two species of *Acronycta*, and a few others demand special treatment, such as hollow sticks, rotten wood, and the like.



## TEMPERATURE AND QUICKNESS OF DEVELOPMENT.

All breeders of Lepidoptera naturally aim not only at obtaining a high proportion of imagines to the number of larvæ, but also at obtaining fine richly coloured specimens. No doubt a large variety of factors conduce to the production of such imagines, but one of the greatest is, I believe, quickness of development in the larval stage. Of course, the average life of larvæ of different species varies enormously, some taking years to come to maturity and others weeks only; so that in speaking of quickness of development I only mean it to refer to the usual length of life of the larva under consideration. Suppose, for example, we have a larva whose average life is three months; it will usually produce a far finer imago, if it comes to maturity in ten weeks, than if it drags on for three and a half months. Other things being equal, the quicker, within certain limits, larvæ can be fed up without interfering materially with their cycles, the larger will be the proportion to pupate and the finer the resulting imagines. This I have found to be particularly the case with larvæ that feed up in the spring or early summer.

Now, if there is one thing that has more influence than another on quickness of development it is temperature. I do not mean by that that the greater the heat the better will be the results. The temperature wants to be consistent with that prevailing under the best conditions at the time of year when the larvæ naturally feed; and, above all, it should be regular. I have frequently obtained quite remarkable results by feeding up certain spring larvæ in a temperature of fifty-five to sixty degrees kept up regularly day and night in April and May. This sort of treatment has one disadvantage, and that is that the imagines may appear two or three weeks or more before their proper time; but against this can be set very many advantages. The larvæ seem very much less liable to ailments: they feed heartily and steadily, there is practically no loss in changing skins or pupation, and the imagines are large and handsome. I have found this use of a steady, fairly warm temperature of the greatest help in rearing larvæ hatched in the spring from ova which were laid the previous summer or autumn, and have by its means bred without any difficulty several species which pass the winter as ova and are considered difficult, if not impossible, to get through successfully in confinement.

Perhaps this effect of a regular temperature is one of the chief reasons why some species vary so enormously in their abundance in different years. If the temperature during the months the larvæ are feeding is unusually warm and steady for that period of the year, then the next emergence of the species will be unusually abundant. It will be noticed that I refer to the temperature being warm, not hot. Great heat and drought

have quite a contrary effect; the larvæ may feed up very quickly, but the imagines are frequently small and stunted. This may very likely be due to the fact that great heat dries up foliage and makes it much less succulent, besides making it more difficult for the larvæ to eat, so that the latter cannot consume enough to keep pace with their rate of development; and what they do consume has very little moisture in it—a commodity most essential to a larva's well-being.

#### HYBERNATING LARVÆ.

The successful hybernation of larvæ is, in my opinion, the most difficult part of larva rearing, and there are comparatively few species that a breeder can bring through the winter, unless he has the use of a garden of fairly large dimensions. The majority of hybernating larvæ require to be on or near their food-plant to live through the winter, and there is little doubt that many larvæ feed far more during hybernation than many persons suppose. Low-feeding larvæ may be successfully treated in a cage in which is placed a flower-pot planted with what they feed on. I would, however, suggest that whatever the plant may be that the larvæ fancy, a little grass should also be put in the pot, for I have found that quite a number of species which never touch grass at other times will frequently nibble it during the winter months.

Tree- and bush-feeding larvæ are best hybernated in sleeves on their special food-plant. The best position to place the larvæ in for the winter is not necessarily the warmest corner of the garden. In fact, if the cages are protected from rain and the sleeves from birds, the colder the position the better, provided it is not too exposed to north and east winds. In hybernation, like everything else, however, the special habits of the species being dealt with must be considered. I would add one point, and that is, that if the cages are entirely protected from rain, the flower-pots inside should be regularly watered, and that it is well to introduce into the cages something besides the food-plant for the larvæ to rest on. Of course, there are some larvæ that eat nothing during their hybernation, and can be kept through the winter in any suitable cage or box in which is placed a little sterilized moss or wood-wool.

(To be continued.)

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#### NOTES AND OBSERVATIONS.

VANESSA ANTIOPA IN KENT.—While fishing for trout on a stream here about a week ago I saw and captured a specimen of *Vanessa antiopa*. It was a hybernated specimen, of course, and was considerably damaged. I have never seen a specimen of this butterfly

in England. Perhaps you would let me hear if other specimens have been taken this spring. Instead of being a rich cream colour as with Continental specimens I have taken, the edging of the wings was a greyish white. This is usual with the English specimens, I believe?—W. H. SMITH; The Mill, Marden, Kent, Whit-Monday, 1915.

BUTTERFLIES OF THE STROUD DISTRICT.—With regard to Mr. Butler's observation on the butterflies of the Taunton district in the May 'Entomologist' (p. 123) I may say the record of the neighbourhood of Stroud within quite as restricted an area is superior, in fact amounts to forty-five species, *viz.* the whole list, including *V. antiopa*, given by him minus *T. betulae* and *L. ægon*, but plus *C. hyale*, *G. c-album*, *L. arion* and *H. comma*.—W. B. DAVIS; 3, Rosebank Villas, Church-field Road, Stroud, Glos.

LEUCOPHASIA SINAPIS.—While collecting in Herefordshire at Whitsuntide, Mr. S. G. C. Russell and I each took a specimen of *L. sinapis* with light brown, instead of black, tips to fore wings. Is not this form very unusual?—F. PENNINGTON; Reform Club, S.W., June 9th, 1915.

SEMIOTHISA LITURATA (ab. NIGROFULVATA) IN WESTMORLAND.—I have to record the capture of a specimen of the above in a pine-wood near Kendal on June 20th, 1915.—FRANK LITTLEWOOD; 22, Highgate, Kendal.

DOUBLE COCOONS.—On p. 44 of the 'Entomologist' for February, 1915, Mr. Hayward invited information regarding instances in which two larvæ had formed a single cocoon in common. As I had an unusually large cocoon of *Dasychira pudibunda* remaining out of a large number, and as emergence was overdue, I cut it open to-day and discovered an empty pupa case and a dead female moth and a living pupa of another female within the cocoon, which had no partition.—H. M. PARISH; Cross Oak Road, Berkhamsted, Herts., May 5th, 1915.

DREPANA CULTRARIA.—I first noticed this moth flying about, high up, on the sunny border of a beech wood near Tring Station on May 8th, and captured three specimens which descended. On the succeeding days I found this moth abundant in a beech wood here, flying about close to the ground, rarely out of reach, at midday, when there was sunshine, until the cold, wet weather set in on the 13th. Since then I have only seen three. Among many captured, not one was of the female sex. I did not see this species at all last year.—H. M. PARISH, May 25th, 1915.

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## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, February 3rd, 1915.*—The Hon. N. Charles Rothschild, M.A., F.L.S., F.Z.S., President, in the chair.—Mr. Adam Charles Smith, of Horton, Mornington Road, Woodford Green, was elected a Fellow of the Society.—



The President announced that he had appointed Mr. G. T. Bethune-Baker, Mr. E. Ernest Green, and Dr. G. B. Longstaff to act as Vice-Presidents for the current session.—Mr. E. B. Ashby exhibited some Ruralids from Southern Europe, including specimens from Digne, Le Vernet, and La Granja.—Mr. E. E. Green, specimens of the giant glow-worm of Ceylon (*Lamprophorus tenebrosus*), and its male—a large firefly.—Dr. H. Eltringham, an instrument made to his instructions by the Cambridge Scientific Instrument Company for cutting paraffin blocks perfectly square preparatory to placing them on the microtome.—Mr. Lupton communicated notes on the life-history of *Agrotis lucerneæ* at Torquay.—Prof. Poulton exhibited specimens of the Australian Buprestid “fire-beetle,” *Merimna atrata*, Lap. & Gory, and read notes; also the Australian Buprestid beetles *Stigmodera conspicillata*, White, and *S. cyanura*, Hope, and proved them to be female and male of the same species—*S. conspicillata*. Prof. Poulton said that he had recently received notes upon the habits of the African ant *Megaponera foetens*, F., and its raids upon termites, from three different observers.—Mr. Talbot exhibited, on behalf of Mr. J. J. Joicey, a number of new forms of Lepidoptera from Biak, the largest of the Schouten Islands to the north of New Guinea.—The Hon. Walter Rothschild, F.R.S., exhibited a series of the four geographical races of *Cocytia durvillei*, Boisd., and *Eucocytia meeki*, Rothsch. & Jord.—The following paper was read: “New Butterflies and a Moth from Biak,” by J. J. Joicey, F.L.S., F.E.S., and A. Noakes, F.E.S.

Wednesday, March 3rd, 1915.—Mr. G. T. Bethune-Baker, F.L.S., F.Z.S., Vice-President, in the chair.—Prof. Wm. Blaxland Benham, M.A., D.Sc., University of Otago, Dunedin, New Zealand, was elected a Fellow of the Society.—Mr. P. A. Buxton exhibited a short series of *Brenthis pales* and *B. arsilache* from Lesjevoerk and Surendal, Central Norway, the former having been taken at an altitude of 3000 ft. to 4000 ft., the latter from 1000 ft. to 3000 ft.—Dr. Cockayne, (1) Gynandromorphous *Agriades coridon*, from Royston. August, 1914. (2) Gynandromorphous hybrid *harrisoni* (*Ithysia zonaria* male × *Lycia hirtaria* female), bred in April, 1912, by Mr. Worsley-Wood.—Mr. J. Platt Barrett, a series of *E. damone* from Mt. Etna, commenting on their lack of variation. Also a series of *E. cardamines* var. *turritis*, remarking on their small size.—Comm. Walker, on behalf of Mr. Adams, (a) A magnificent series of varieties of *Polygonia c-album*, including several strongly suffused examples, from the Forest of Dean. (b) Two specimens of *Araschnia levana*, gen. æst. *prorsa*, from the same locality, taken in 1914. (c) A gynandromorphous *Urbicola comma*, right side female, left side male, from Box Hill. (d) A very fine melanic aberration of *Dryas paphia* female, from S. Wales.—Mr. F. W. Edwards, two species of apterous Diptera, one belonging to the *Borboridæ*, the other to the *Ephydridæ*, both collected in the Falkland Islands by Dr. Malcolm Cameron, Fleet Surgeon of H.M.S. ‘Cornwall,’ on December 7, the day before the naval battle. Both appeared to be new to science, and probably represented new genera.—Mr. L. W. Newman, a living pupa of *Pyrameis atalanta*, and read notes on the copulation of *P. atalanta*



in October, and the hybernating of the species in the pupal stage.—Prof. Poulton, a portion of a large family of *Acræa encedon*, L., bred at Durban from a known female parent by Mr. E. E. Platt. Prof. Poulton described the hybernation of vast numbers of *Musca corvina* in the cistern-loft of St. Helen's Cottage, St. Helen's, Isle of Wight.—The following paper was read as a basis for a discussion on mimicry: "The Mimetic Theory—"A Crucial Test," by Colonel N. Manders, F.Z.S., F.E.S. A most important reply was made by Mr. C. F. M. Swynnerton, which he has embodied in the following paper: "A Brief Preliminary Statement of a few of the Results of Five Years' Special Testing of the Theories of Mimicry." Several Fellows took part in the discussion.

Wednesday, March 17th, 1915.—The Hon. N. C. Rothschild, M.A., F.L.S., F.Z.S., President, in the chair.—Prof. Poulton, a female Asilid, *Promachus* sp., captured with its prey, a male *Delias descombesi*, Boisd., August 18th, 1914, at Takdah (5000 ft.), Sikkim, by Major T. D. Broughton. Prof. Poulton, the specimen of the African Hesperid butterfly *Platzia cerymna*, Hew., referred to in the following note written December 26th, 1914, by Dr. G. D. H. Carpenter, from Kakindu, about thirty miles west of the Victoria Nyanza and 500 ft. above it: "I send you a skipper of much interest. It came to light one night [December 23rd] about 9 p.m., and behaved much like a moth; the large white patch on the antenna was *extremely* conspicuous and really *glistened* in the light, almost as if it were phosphorescent." Prof. Poulton said that the species was usually diurnal.—Comm. J. J. Walker exhibited, on behalf of Mr. F. C. Woodforde, bred specimens of *Zonosoma pendularia*, L., var. *subroseata*, Woodforde, and var. *subochreatea*, Woodforde, with the type-form of the species for comparison.—Mr. W. C. Crawley, drawings in various species of ants of two kinds of organs in the funiculi of antennæ. They are often, if not always, in the living insects filled with air, and may possibly be connected with the sense of hearing. He also exhibited several drawings of the genital armatures of male ants.—Mr. H. Willoughby Ellis, two teratological specimens of Coleoptera, viz. a male specimen of *Carabus nemoralis*, Mull., and a specimen of the dark variety of *Campylus linearis*, L.—Mr. Champion exhibited, on behalf of Mr. W. West, of Greenwich, specimens of *Bruchus chinensis*, L. (*pectinicornis*, L.), found in lentils in a London warehouse, also a male found at large at Dartford.—Dr. F. A. Dixey made a communication on the nuptial flight of butterflies.

Wednesday, April 7th, 1915.—Dr. G. B. Longstaff, M.A., M.D., Vice-President, in the chair.—At the unanimous request of the Council, the Chairman proposed that a letter should be written to the President, on behalf of the Society, offering condolences on the sudden death of his father, the late Lord Rothschild. The resolution was unanimously passed, the whole meeting rising in their places.—Mr. William Carr, B.Sc., Station Road, Bentham, Lancaster, and Dr. A. Eland Shaw, Samarai, British New Guinea, were elected Fellows of the Society.—The Rev. G. Wheeler exhibited a box of Algerian butterflies, of species treated of by Mons. Ch. Oberthür in the recently published Fascicule X. of his 'Lépidoptéro-

logie Comparée'; many of the species were exhibited for the first time in England.—Mr. O. E. Janson, a new species of *Cælorrhina* (family *Cetoniidæ*), in which the cephalic male armature usual in this genus was entirely absent, and to which he had given the name *mutica*.—Mr. H. Willoughby Ellis, a British variety of the Pentatomid bug *Palomena prasinæ*, L., differing from the type in its larger size and dark olive colour. Taken on ivy at Torquay, May 25th, 1907.—Mr. E. B. Ashby, several species of North American *Papilio*s.—Mr. H. St. J. Donisthorpe, a chart of the names applied to the genital armature of male ants, and read notes.—The Rev. F. D. Morice, a series of lantern-slides to show the structure of the male genital armature and the ventral segments adjoining it in various groups of Aculeate Hymenoptera.—The following paper was read: "Hymenopterous Parasites bred from the Pupæ of *Chortophila brassicæ*, Bouché, and *Acidia heraclei*, L.," by J. T. Wadsworth, Research Assistant, Dept. of Entomology, University of Manchester; communicated by Dr. A. D. Imms, D.Sc., B.A., F.L.S., F.E.S.—REV. G. WHEELER, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*March 25th, 1915.*—The President in the chair.—The evening was specially devoted to an exhibition and discussion of *Aphantopus hyperanthus*, contributed to by Messrs. Frohawk, R. Adkin, Bright, B. Adkin, Edwards, Dennis, Turner, Curwen, Ashdown, Gibbs and Leeds; ab. *arete*, ab. *vidua*, ab. *ocellatus*, ab. *lanceolata*, ab. *minor*, var. *bieti*, ab. *cæca*, ab. *obsoleta*, with numerous other forms, were shown.—Mr. Bright showed a fine *Argynnis aglaia* with numerous coalesced blotches of black, a *Polyommatus icarus* with extremely light ground on the under side, and a male *Agriades coridon* of the form *suavis*, in which red scaling was developed, adjoining the eye-spots of the hind wings upper side.

*April 8th, 1915.*—Mr. W. J. Kaye, F.E.S., in the chair.—Mr. Edwards, the seasonally dimorphic forms of *Papilio ajax* from North America.—Mr. Schmassman, specimens of *Papilio homerus* from Jamaica, with a female having male coloration, and the rare Pierid, *Hebomoia repstorffii*, from the Andamans.—Dr. Dixey, F.R.S., read a paper on "Seasonal Dimorphism," and gave many lantern and other illustrations with his remarks.

*April 22nd, 1915.*—Mr. A. E. Gibbs, F.L.S., F.E.S., Vice-President, in the chair.—Mr. T. B. Foster, of Addiscombe, was elected a member.—The evening was devoted to an exhibition of Orders other than Lepidoptera.—The Hon. Curator, Mr. West, exhibited eight drawers of the Society's reference collections which had recently been re-arranged, and included the drawer containing the Diptera given by Mr. H. W. Andrews.—Mr. West also exhibited four drawers of his own collection of Coleoptera, including British examples of *Calosoma sycophanta*, *Carabus auratus*; a series of *Micraspis 16-punctata*, *Dityseus circumcinctus*, females with smooth male-like elytra, and a series of forms of *Notiophilus 4-punctatus*.—Mr. Ashdown, a series of aberrations of the earwig *Forficula auricularia*, mostly with aberrant size and form of forceps.—Mr. W. J. Kaye, numerous large and conspicuous insects obtained by him in South America and

Trinidad, Coleoptera, Phasmids, a Mygale, *Cordiceps*, &c.—Mr. B. Adkin, examples of *Chermes pini*, the pine aphis, on Scots pine.—Mr. Main, an example of the Neuropteran *Nemoptera coa*, brought from Cintra by Mr. Bowman, and living larvæ of the firefly *Luciola italica*.—Mr. R. Adkin, the nests of wasps found rolled up in bales of tobacco from the Levant.—Mr. Platt Barrett, various conspicuous insects from Sicily and South Africa, mantis, ant-lion, locusts, &c.

May 13th.—Mr. A. E. Tonge, F.E.S., Vice-President, in the chair.—Mr. Leeds exhibited aberrations of *Polyommatus icarus*, including ab. *obsoleta*, an asymmetrical specimen near *obsoleta*, a chocolate banded under side, and a female streaked with blue; of *Agriades thetis*, including a female without orange in margin and bluish clouded, males with aberrant eye-spots below, &c.; of *A. coridon*, including dark suffused below, slaty suffused below, females with khaki streaks above, and ab. *semisyngrapha*; of *Cænonympha pamphilus*, including dark suffused below, and an under side with additional spotting; of *Pararge ægeria*, the British form *egerides*, and Cornish forms much like the S. European form *ægeria*; of *Pieris brassica*, a female with a pale blue tinge throughout.—Mr. Adkin, a short series of the hybrid *Biston hirtaria* ♂ × *Nyssia lapponaria* ♀, and gave notes on the mixture of the two specific series of characteristics.—Mr. Moore, *Manduca atropos* from S. Africa.—Mr. Curwen, long series of *Polyommatus eros* and *Latiorina orbitulus* from Saas Grund and the Grisons respectively.—Mr. B. S. Williams, larvæ of *Odezia atrata* on *Cytisus*, and a very varied series of *Xanthorhoe fluctuata*, with ab. *neapolisata* from Finchley.—Mr. Cowham, cases of the large Psychid *Oeketicus platensis*, examples of the Neotropical *Colias*, *C. lesbia*, a large and conspicuously marked "skipper" *Pyrrhopyga* sp., and an Arctiid, *Epanthera* sp.—Mr. Barrett, a large number of Lepidoptera mainly from Sicily, and read notes on the variation; they included *Thais polyxena*, *Pontia daplidice*, *Anthocharis belia*, *Euchloë cardamines*, with their racial, seasonal, and aberrational forms.—Mr. Dennis, photographs of the ant *Formica pratensis*, a species closely allied to *F. rufa*.—Mr. Stallman, a *Tæniocampa gothica* female with right hind wing reproducing the markings of the fore wing on the upper side, from Holmwood.—Mr. B. Adkin, Lepidoptera from Loch Lomond, dark suffused *Brenthis selene* and *Diacrisia sannio*, a white suffused under side of *Cænonympha pamphilus*, &c.—Mr. A. Sich read a paper, "Notes on *Tortrix viridana*," on which a short discussion took place.

May 27th.—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—Mr. Sich exhibited ova of *Tortrix viridana* laid in pairs on the bark of an oak, and cases of *Solenobia*, presumably *S. lichenella*, from Barnes.—Mr. Moore, Lepidoptera from near Johannesburg, Transvaal, including *Hypolimnas misippus*, *Precis sesamus*, *Colias electa* and var. *aurivillius* (comparable to *C. edusa* and var. *helice* of Europe), *Papilio demodocus*, *Pyrameis cardui* (the small Æthiopian race), *Hippotion celerio* and *Bastothia media*, a small green Sphingid.—Mr. B. S. Williams, larvæ of *Xylophasia scolopacina* from Finchley, and a series of *Tricopteryx (Lobophora) polycommata* from Yeovil.—



Mr. Lachlan Gibb, on behalf of Mr. H. M. Simms, a fine suffused aberration of *Pyrameis huntera* from near Montreal, an ab. *bellus* of *Bithys quercus* from near Barmouth, and an aberration of *Phaetra (Acronicta) menyanthidis*, in which the orbicular stigmata were absent, from near Sheffield.—Mr. Priske, an example of the Tenebrionid Coleopteron, *Morica planata*, from Gibraltar.—Mr. Bunnett read a short paper, "The Maple Aphis," illustrated with drawings and lantern slides.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*March 15th, 1915.*—Dr. J. Cotton, Vice-President, in the chair.—Dr. A. Randell Jackson, M.D., M.Sc., Westcote, Hoole Road, Chester, was elected a member of the Society.—Mr. Leonard West, M.I.M.E., read a paper entitled "A short Account of Some Neuroptera." The paper was fully illustrated by lantern slides of the principal species of the various orders; these were treated in a way specially designed to enlist the interest of the young entomologist, the metamorphoses and general economy of the Stone-flies, May-flies, and Caddis-flies being ably described by the author. At the close of the paper Mr. West also showed a number of beautiful slides of river scenery as examples of the breeding-places of the insects, and as showing the loveliness of the country the student would become familiar with in pursuit of these comparatively little-known creatures.—WM. MANSBRIDGE, *Hon. Sec.*

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—*April 7th, 1915.*—The Secretary showed, for Mr. J. Ray Hardy, the two Longicorns *Dendrobius* and *Acanthinodera*.—Mr. Watson's "Notes on Parnassias" was an interesting account of an interesting genus. He dealt at length with the geographical distribution of the various species and varieties, drawing attention to the fact that evidence would seem to indicate that these insects apparently prefer cold rather than warm regions. His paper was illustrated with numerous and beautiful specimens—J. E. COPE, *Hon. Sec. (pro tem)*.

LONDON NATURAL HISTORY SOCIETY.—*February 2nd, 1915.*—Annual Exhibition.—Dr. Cockayne exhibited an extreme specimen of *Itumicia phlæas* ab. *eleus* from Berkhamsted, 1911 (a very hot season); a specimen of *Agriades coridon* ab. *semisyngrapha*, Tutt, from Royston, showing additional blue scales on inner margin of left fore wing (a gynandromorph); also a photograph of the specimen in which the gynandromorphic characters were clearly shown.—Mr. C. P. Pickett, long series of *Agriades coridon* from Royston, the result of four years' collecting, including males and females with under side markings, obsolete ab. *inequalis*, Tutt, and certain gynandromorphic females with one side smaller than the other, the small side having scattered blue scales; a specimen in which the male element was on the larger side, and a female unequal on the two sides, the lunules larger and brighter on the right side, which was also of the ab. *parisiensis* form beneath.—Mr. H. B. Williams, *Mimas tilia*, and some of its commoner aberrations, including ab. *centripuncta*, Clark, and a long series of



*Amorpha populi*, including two gynandromorphs bred from one brood in 1914; also a drawer of under side forms of *Polyommatus icarus*, including ab. *obsoleta*, Clark, ab. *antico-striata*, Tutt, and others.—Mr. H. W. Wood, *Larentia flavicinctata*, type from Rannoch, and a remarkable light local race from Ireland; three yellow abs. of *Brephos parthenias* from Surrey; *Nonagria neurica* and its abs. *fusca* and *rufescens* from East Sussex; *Acidalia immorata*, bred as a third brood from Lewes, October, 1913; *Sterrhia contiguaria* and a melanic form, and a drawer of *Mellinea ocellaris* and all its known British varietal forms, including abs. *lineago* Gn. and *intermedia*; also the allied species *fulvago*, L., *gilvago*, Esp., and *gilvago* ab. *suffusa*; also drawings by Mr. Backlade of the differentiated parts of the genitalia (penis with cornuti) of the allied species *ocellaris*, *gilvago*, and *fulvago*.—Mr. J. Riches, a series of *Abraxas grossulariata* bred from wild North London larvæ from 1905 to 1913, including abs. *nigrosparsata* and *deleta* (*lacticolor*), and one approaching *varleyata*; also, on behalf of Mr. Dewey, of Eastbourne, three *Chelonia caja*, with yellowish-orange hind wings, and two *Arctia villica* with confluent markings, all bred in 1914; and nine *Brenthis euphrosyne* with confluent markings, taken in Abbots Wood in 1913 and 1914.—Mr. G. T. Porritt, *Abraxas grossulariata* ab. *nigrocostata* (a magnificent form), and five extreme ab. *nigrosparsata*, bred from wild Huddersfield larvæ in 1914; also an extraordinary small second brood specimen bred from a wild larva.—Mr. L. W. Newman, series of *Callimorpha dominula* and its ab. *rossica* from Kent; of *Thecla pruni*, bred 1914, from Hants; and of *Pieris napi* from Ireland, including strongly-marked and yellow females (second brood).—Mr. A. W. Mera, series of *Cænonympha davus* and *C. pamphilus*, the latter including a female with a patch of upper side coloration containing an eye-spot on the under side of the left hind wing; also the British *Acidaliids*, including melanic forms of *cambricata* and *incanaria*.—Mr. R. G. Benton, a specimen of *Crymodes exulis* ab. *assimilis*, taken at sugar at Braemar.—Mr. W. E. King, a long and varied series of *Hybernia defoliaria* from Epping Forest, including a fine melanic male.—Mr. V. E. Shaw, a series of *Cyaniris argiolus*, bred 1914, from Sandown (Isle of Wight) larvæ; a long series of *Eupithecia extensaria*, bred May, 1914, from Norfolk larvæ; and specimens of *Salebria semirubella* and its ab. *sanguinella*, from Dover, 1914.—Mr. H. T. Payne, two drawers of *Leucaniids*, including *Nonagria cannae*, *N. arundinis*, and ab. *fraterna*, *N. sparganii*, *Tapinostola bondii*, *Leucania vitellina*, and *L. brevilinea*.—Mr. A. W. Buckstone, a specimen of *Brenthis selene*, with black markings obsolescent, from Guildford; *Thecla quercus* ab. *bellus* from Oxshott; a specimen of *Euchelia jacobææ* with hind wings smoky black and transparent, from Oxshott; a fine obsolescent under side of *Polyommatus icarus* from Sevenoaks, and several smoky females of *Bupalus piniaria*, bred from Oxshott.

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## THE BEE-GENUS *NOMIA* IN THE PHILIPPINE ISLANDS.

BY T. D. A. COCKERELL.

A SERIES of *Nomia* from the Philippines, received from Professor C. F. Baker, greatly enlarges our knowledge of the genus as represented in that archipelago, and also makes it possible to correct some misconceptions. Some of the species had previously been examined by Dr. H. Friese, whose identifications were transmitted to me. Dr. Friese has very kindly permitted me to describe certain Philippine bees to which he had given manuscript names.

### *Nomia iridescens*, Smith.

P. Princesa, Palawan (Baker 3847). This is a male, known from other Philippine species by the unarmed postscutellum, the brilliant green and purple abdominal bands, and the practically unmodified hind legs. The first five segments are banded, as in Singapore males.

### *Nomia thoracica*, Smith.

Los Banos, Luzon (Baker 311). A female, determined as *thoracica* by Friese, but small for that species, and possibly representing a distinguishable insular race. This is doubtless the insect which Ashmead described as *stantoni*, from a male; it is perhaps to be called *N. thoracica stantoni*. The abdomen has four white tegumentary bands, and the thorax above is covered with dense fulvous moss-like pubescence.

### *Nomia incerta*, Gribodo.

P. Princesa, Palawan (female, Baker 3849; male, Baker 3846); also from Los Banos, Luzon (female), and Tacloban, Leyte (male, Baker 3851, 3852). This is the species described by Ashmead as the male of *N. quadrifasciata* (Ashm.), but that name must be restricted to the supposed female, which is evidently a male of a different species, and is described first and more fully than the insect regarded as its male. Dr. Friese had identified it as *N. elliotii*, Smith, but it has no green band on the first abdominal segment in either sex, whereas this band is

present in *elliottii*. A female, compared with one of Smith's cotypes of *elliottii*, is somewhat smaller, and has the first two abdominal segments more shining and strongly punctured. The general structure and the colour of the bands (brilliant yellowish green shot with vermillion) are quite the same. Gribodo's description of *N. incerta*, from Java and the Sulu Islands, evidently applies to our species.

*Nomia elongata*, Friese.

Males; Los Banos, Luzon (Baker 6). Determined by Friese, who described the species from Java. This is close to the Australian *N. pseudoceratina*, Ckll. Smith described two species of the same type, with clavate abdomen, from the Malay region: *N. ceratina* from Sarawak, and *N. clavata* from Gilolo. Just at present I am not able to say how *N. elongata* can be distinguished from *ceratina* and *clavata*; they are at least very closely allied. *N. clavata* may perhaps be separated by the more highly-coloured tarsi.

*Nomia elongatula*, n. sp.

Males; Los Banos, Luzon (Baker 3850). A small species with clavate abdomen, like *N. elongata*, but smaller (length 6.5–7 mm.), with the stigma clearer red and the apex of wings less distinctly infuscated. The knees are bright ferruginous, and the flagellum is red beneath, these parts being only very obscurely reddish in *elongata*. The really decisive character, however, is found in the fifth ventral abdominal segment, which has a pair of bright red spots, each bearing a pair of black tubercles, the posterior of which is compound. *N. elongata* has not this character.

*Nomia takauensis philippinensis*, Friese, n. subsp.

Both sexes from Los Banos (Baker 312). *N. takauensis* was described from Formosa, only the male being known. The mesonotum in true *takauensis* has the hair almost felt-like; in the Philippine insect the hair is thin, exposing the finely punctured surface. The legs appear to be darker in the Philippine form. The female differs in the usual sexual characters; the first four abdominal segments have apical ochreous hair-bands, while the fifth is densely margined with soot-coloured hair. The head is broad, and the flagellum very short. Hair on outer side of hind tibiæ white.

*Nomia palavanica*, n. sp.

♀. Length 7 mm. or slightly more; similar to *N. takauensis philippinensis*, but differing as follows: stigma much larger, pale amber, not dusky; head shorter, being transversely oval; apical half of mandibles red; mesothorax more closely punctured; hair on and about scutellum not bright fulvous; hind margins of abdominal segments castaneous, with weaker hair-bands, hair on apical margin of fifth wholly light; first abdominal segment not so broad; anterior and middle knees bright ferruginous. The stigma is larger and

yellower than that of *N. elongatula*, but I think the two species are allied, and the male of *N. palavanica* will be found to have a clavate abdomen.

The following key will facilitate the separation of the Philippine *Nomia*:—

- |  |  |    |
|--|--|----|
| Abdomen pale red (Sulu Islands)                            | <i>dimidiata</i> , Vachal.                 |    |
| Abdomen not red  |  | 1. |
| 1. Antennæ and legs entirely dull ferruginous; female      |  |    |
| 12.5 mm. long (Palawan)                                    | <i>philippina</i> , Vachal.                |    |
| Antennæ and legs otherwise coloured                        |  | 2. |
| 2. Postscutellum bidentate or bispinose                    |  | 3. |
| Postscutellum unarmed                                      |  | 4. |
| 3. Male with hind tibiæ, except a large black spot behind, |  |    |
| and hind basitarsi, yellowish                              | <i>quadrifasciata</i> (Ashm.).             |    |
| Male with hind tibiæ, except apical process, and hind      |  |    |
| basitarsi, black   | <i>incerta</i> , Grib.                     |    |
| 4. Abdomen with tegumentary bands, but covered with hair   |  | 5. |
| Abdomen with hair-bands, or, if these are weak, hind       |  |    |
| margins not white or green                                 |  | 6. |
| 5. Abdominal bands white                                   | <i>thoracica stantoni</i> (Ashm.).         |    |
| Abdominal bands green and purple                           | <i>iridescens</i> , Smith.                 |    |
| 6. Abdomen clavate (males)                                 |  | 7. |
| Abdomen not clavate  |  | 8. |
| 7. Fifth ventral segment of abdomen with two red spots     |  |    |
| bearing black prominences                                  | <i>elongatula</i> , Ckll.                  |    |
| Fifth ventral not thus; larger species                     | <i>elongata</i> , Friese.                  |    |
| 8. Head transversely oval; stigma pale amber               | <i>palavanica</i> , Ckll.                  |    |
| Head longer; stigma smaller, dusky; abdomen not cla-       |  |    |
| vate in male   | <i>takauensis philippinensis</i> , Friese. |    |

## BRITISH NEUROPTERA IN 1914.

BY W. J. LUCAS, B.A., F.E.S.

BESIDES a capture of the rarity *Drepanepteryx phalenoides*, Linn., but little of interest has come to my notice with regard to the Neuroptera in 1914. The first species seen was *Heemerobius stigma*, Steph., which was on the wing in the New Forest on March 2nd. On March 8th I took a dark specimen on the wing at Esher Common, Surrey; on March 15th it was fairly common there. This appears to be our earliest species, and it is usually possible to obtain it by beating the Scotch firs throughout the winter—at any rate in the south of England.

On the date last mentioned (March 15th) a visit was paid to Esher Common with Mr. C. B. Williams specially to search for larvæ and pupæ of *Raphidia*, and a fair number of both were obtained. They were met with chiefly in the layers of the bark of the decaying stumps of Scotch firs left in the ground when the



trees were cut down. All, I believe, were found near the periphery of the stumps, and were living apparently under quite damp conditions, which was scarcely the case where Mr. G. T. Lyle and myself found them in the New Forest in 1913 (*vide* Entom. vol. xlvii. p. 190). All appeared to be *R. maculicollis*, Steph.; some of the larvæ were quite small. During the search a number of *Campodea*, presumably *C. staphylinus*, were found. Mr. D. Sharp gave me a male *R. maculicollis*, taken in the New Forest in April.

*Sialis lutaria*, Linn., was first noticed on April 19th, near Brockenhurst, in the New Forest.

*Hemerobius humuli*, Linn., was taken on May 17th on the North Downs near the Silent Pool in Surrey; while *H. lutescens*, Fabr. (or possibly *H. humuli*), and *H. micans*, Oliv., were met with in the New Forest on August 19th.

Of the genus *Chrysopa*, *C. flava*, Scop., was taken at Littleworth Common, Surrey, on June 17th; *C. ventralis*, Curt., in the New Forest on May 30th and 31st; *C. prasina*, Ramb., in the New Forest on August 16th; *C. perla*, Linn., in the New Forest on May 31st and June 22nd, as well as on the North Downs in Surrey, near Albury, on June 27th; *C. vulgaris*, Sch., at Duck Hole Bog, in the New Forest, on September 2nd. Mr. Lyle sent me a living example of the last from the New Forest, swept from heather, on September 19th, when a good number were about. A damaged example of the genus from the New Forest in August appears to be *C. alba*, Linn. Mr. G. T. Porritt says that in some seasons *C. tenella*, Sch., is abundant in his garden, but in 1914 he saw two only, although constantly on the look-out for them.

*Panorpa communis*, Linn., was noticed in the New Forest—a male, July 4th–5th, a female on June 22nd.

On October 25th Mr. E. A. C. Stowell sent me a specimen of the scarce Neuropteran *Drepanepteryx phalænoides*, Linn. He found it sitting very quietly on the glass of a street lamp in the outskirts of Bexhill, between 10 o'clock and 10.30, about three-quarters of a mile from the sea on the road to Pevensey. There were some new houses near and a piece of waste ground covered with gorse, briars, small sallows, &c.—a field abandoned for building purposes; the soil was clay. As Mr. Stowell did not recognise it at first, the night of capture was not noted; but it was in the last week of July or the first fortnight of August, during a "dead season" at the lamps, the summer things being over and the autumn ones not begun. Mr. Stowell says:—"The one who named it *Drepanepteryx phalænoides* hit it exactly. *Drepana* is the hook-tip genus of moths, and *phalænoides* means, I take it, 'moth-like.' It is *exactly* like *Drepana falcatoria*, and 'By the flickering moonbeam's misty light and the lantern dimly burning' I took it for that species. I soon found there

was something wrong; but I had never before seen a 'fly' with a moth-pattern on its wings. Previously I had looked upon Neuroptera with a sort of benevolent neutrality only. When alive, it sat with its wings like a very steep roof, after the manner of the caddis-flies." The insect was exhibited by me at the meeting of the Entomological Society on December 2nd, 1914, when Messrs. H. J. Turner and O. E. Janson told me that they each possessed a specimen; but that belonging to the former is without data, while Mr. Janson is not at the present time able to put his hand upon the latter.\*

Writing the next day, Mr. E. A. Butler said:—"As far as I know, this is the second specimen from the Hastings district. The first was one that I took when a boy, somewhere about the



*Drepanepteryx phalaenoides*, Linn. ( $\times 3$ ). W. J. Lucas photo.  
(The head is a little damaged.)

late 'fifties' or early 'sixties' at Hastings. Of course I did not know what it was when I took it, and it was some years before I found out the name of it. About thirty years ago I shewed Mr. McLachlan all that was left of the specimen—the right fore wing—and he confirmed the identification of the insect. Even this relic seems to have now disappeared, as I cannot find it anywhere. I am sorry to be unable to give the exact date of the capture." In the Ent. Mo. Mag. vol. xxi. pp. 54 *et seq.*, Mr. K. J. Morton has collected much information with regard to this insect and its occurrence in Britain.

Kingston-on-Thames, July, 1914.

\* I hear now that this specimen of *D. phalaenoides*, believed to be unrecorded, was given by Mr. Janson to Mr. C. A. Briggs. It is labelled:—"From the cabinet of F. Walker, Lanarkshire." It is mounted on a rather heavy pin, and is in poor condition.

## ADDITIONS TO THE LIST OF KENT APHIDIDÆ.

BY FRED. V. THEOBALD, M.A.

THE following aphides were found in Kent in 1914-1915, and are additions to the lists I have already published in this Journal. Besides those mentioned here, I have a handsome new species of *Macrosiphum* found swarming on red valerian (*Centhranthus ruber*) on the chalk cliffs at Margate and at Wye; a new *Macrosiphum* on red lamium (*Lamium purpureum*), and a new *Rhizobius* on the roots of spruce (*Picea sitchensis*).

*Macrosiphum fragariæ*, Koch.—This very fine green mealy species with black head, legs, and long thin outwardly curved cornicles, was found at Wye, June 30th, 1914, on leaves and stalks of the strawberry, and on the valerian (*Centhranthus ruber*); alate females were just appearing. They occurred in company with *Macrosiphum centhranthus*, nov. sp.

*Macrosiphoniella chrysanthemi*, Del Guercio.—Alate and apterous females in the end of September, and on to December both out of doors and under glass on cultivated chrysanthemums at Wye and Maidstone, doing a considerable amount of damage.

*Aphis urticaria*, Kaltenbach.—Abundant on nettles, Wye, June 7th, 1914, and June 21st, 1915, and swarming on wall pellitory (*Parietaria officinalis*) May to October, both apterous and alate females, somewhat smaller than those on the nettles in June and July, 1912-1914.

*Aphis adjecta*, Walker.—Littlestone and on Romney Marsh, June 14th, 1914, on the flower heads of the hound's-tongue (*Cynoglossum officinale*); many apterous females. This marked, very small yellow species does not seem to have been recorded since it was described.

*Aphis infuscata*, Koch.—Romney Marsh, June 14th, 1914, on *Prunus spinosus*—alate and apterous females, curling up the small leaves, some of which were pale yellow and pink.

*Aphis helichrysi*, Kaltenbach.—Bearsted, June 13th, 1914, alate and apteræ swarming in the flower heads of the yarrow (*Achillea millefolium*).

*Aphis anthrisci*, Kaltenbach.—On flower stalks and blossoms of *Anthriscus*, sp., Wye, July 8th, 1914. This species was much attended by ants, which swarmed over the two colonies I found, and yet they did not appear to be producing much "honey dew."

*Aphis sedi*, Kaltenbach.—On the yellow sedum or wall pepper (*Sedum acre*) at Littlestone, June 14th, 1914, and Wye, July 17th, 1914; two alate females, and two apteræ. Apparently very rare in this district of England, as I have frequently searched for it and only managed to get three specimens at Littlestone and one at Wye last year.

*Aphis chrysanthemi*, Walker.—Clustering on the flower stalks

of the ox-eye daisy (*Chrysanthemum leucanthemum*) at Wye, July 4th, 1914, on the banks of the railway, and July 20th, 1914, on a cultivated species in my garden. In both cases alatæ, nymphæ and apteræ in great numbers, and much deforming the cultivated plants.

*Aphis scabiosæ*, Kalténbach.—Two large colonies of this aphid were found on June 21st in King's Wood, near Wye. They consisted mainly of apteræ, but a few alate females. The colonies were not on the apex of the plants, as is usual, but half up the stems. I have not yet examined these insects microscopically, so cannot say for certain if they are the same as the *Aphis urticaria* of Kalténbach, but they have a strong general resemblance.

*Aphis galii*, Kalténbach.—On galium or maywort (*Galium cruciatæ*). Apteræ only at Wye, June 9th, 1914, and again in June, 1915, on the same plant in King's Wood, Wye.

*Callipterus platani*, Kalténbach.—This insect was described by Kalténbach as a *Lachnus*. I know of no records since the original description. I found it on the young sycamores in the small forest nursery of the Agricultural College at Wye on July 29th, 1914, and in much greater abundance on August 30th, 1914, when a few alatæ were found. This insect was largely attended by the ant *Lasius fuliginosus*.

*Chaitophorus betulæ*, Buckton.—On birches at Cranbrook, July 3rd, 1914.

*Pachypappa reaumuri*, Kalténbach.—This very marked and apparently scarce insect, described by Kalténbach under the genus *Schizoneura*, occurred on lime trees (*Tilia*, spp.) at Bearsted in June, 1914 (*vide* 'Entomologist,' April and May, 1915).

*Pemphigus piceæ*, Hartig.—I find an old preparation of this species found at Wye in 1905 in my collection taken on the roots of spruce (*Picea excelsa*), and again in 1915 on the roots of the Sitka spruce in April. It seems also to attack the roots of various *Pinus*, and one specimen I have from the roots of *Larix* is so similar I feel they must be the same.

*Prociphilus nidificus*, Loew.—Forming very marked leaf gall tufts on the ash at Wye, July 7th, 1914. Some years ago a photograph of the "leaf-tufts" formed by this aphid were given me from a specimen taken at Wye. The only other British specimens I have seen were sent me by Dr. MacDougall from Scotland in 1914.

*Prociphilus bumeliæ*, Schrank.—I find I have some apteræ of this species taken on the leaf stalks of the ash as far back as 1908. I had previously taken this and the former species to be the same. They are quite distinct.

*Lachnus fasciatus*, Burmeister. - Common on the spruce (*Picea excelsa*) at Wye, May to July, 1904-1914; Tunbridge



Wells, June, 1914; Westwell, July 4th, 1914; Canterbury, June 14th, 1912.

*Rhizobius pini*, Burmeister.—A white aphid at the roots of various *Pinus* was found in 1914 and 1915 in March, and April and on into May, which comes very near Hartig's *Pemphigus piceæ*. I feel sure that this is *Rhizobius pini* of Burmeister, the antennæ being shorter than in *Pemphigus piceæ*, Hartig.

On spruce roots I have also found a bright green aphid covered with white wool, which is evidently an undescribed species of *Rhizobius*. It was doing considerable damage to some nursery plants at Wye during the winter 1914-1915, the ground, when the spruce were lifted, being quite white from the quantity of woolly substance they had secreted. This will shortly be described under the specific name *viridis*.

## FOUR NEW ENCYRTIDS FROM SICILY AND THE PHILIPPINES.

By A. A. GIRAULT.

### 1. *Paraleptomastix abnormis*, n. sp.

*Female*.—Length, 1.00 mm.

Differs from the description of the genotype in being like species of *Leptomastix*, except that the postmarginal vein is elongate, a third longer than the slender stigmal, and over thrice the length of the marginal, the latter barely twice longer than wide.

Golden yellow—often dusky yellow—marked with dusky black as follows: Distal half to two-thirds of the abdomen, bulb of scape, cephalic aspect of the last two pairs of coxæ; funicles 1 and 2, club, proximal two-thirds of pedicel above, a conspicuous streak along the dorsal scape for its entire length, dorso-lateral edge; and frequently the entire disk of pronotum and scutum. Rest of antennæ pallid dusky, the scape, abdomen, pedicel, pro- and mesopleurum silvery. Propodeum blackish except laterad of the spiracle. Venation dusky. Apex of caudal wing and a longitudinal oblique streak opposite the submarginal vein, dusky. Fore wing conspicuously trifasciate, the first cross-stripe smallest, incomplete, obliqued caudo-proximad from before the bend of the submarginal vein; the second is complete, broader caudad, from the postmarginal vein; the third is largest, across just before the apex, not very broad, divided at middle narrowly and obscurely by a less dusky streak. Pedicel somewhat longer than wide at apex, somewhat shorter than funicle 1, which is two and a-half times longer than wide; funicles 3 and following each being somewhat longer than 1. Club joints subequal to the pedicel. Head densely scaly punctate. Axillæ with a short carina between them. Scrobes distinct, not joined above. Dorsal thorax with a short silvery pubescence.

The male is about the same, but the third or distal stripe of the

fore wing may be nearly absent, usually distinct. The scape is more compressed, the pedicel barely longer than wide, the club solid, the flagellar joints (excluding the pedicel) all somewhat longer and with scattered, rather long hairs, the funicle joints shorter than the club.

Described from a series of specimens reared from *Pseudococcus citri*. Sicily, Calif. State Insectary, 700 xv. H. S. Smith.

*Types*.—Catalogue No. 19409, U.S.N.M.; a female and a male on slides; two paratype females on tags.

### 2. *Epidinocarsis pseudococci*, n. sp.

*Female*.—Length, 1.50 mm.

Dull orange-yellow, the wings hyaline and like *Blastothrix yuccæ*, Coquillett, but the apex of funicle 1 is white, and the head is entirely yellow except the occiput (vertex dusky in the other species): also over the distal half of the pedicel is white, funicle 6 is barely longer than wide (longer in *yuccæ*, where only the distal fourth of the pedicel is white): the funicle joints are all somewhat shorter, the stigmal vein is straighter, longer than the marginal, the postmarginal subobsolete (in *yuccæ* the stigmal vein is more curved, shorter, subequal to the marginal, the postmarginal distinct, acuminate, somewhat shorter than the stigmal): the hairless line in *yuccæ* is much less definitely limited. Also in *yuccæ* the axillæ are joined with a carina between them; here they are separated for some little distance (but may be occasionally as in *yuccæ*). Also in this species only the median line of the scutellum is black (all in *yuccæ* except lateral and apical margins). Scrobes distinct, rather long.

The male is smaller and all black, except base of scape and the legs (except coxæ). In the male the marginal vein is subquadrate, the head flatter, the antennæ 9-jointed, the scape's dilation not great, the pedicel globular; flagellum dusky white except pedicel; funicle 1 nearly thrice longer than wide, shorter than the club, the flagellum with rather thick, scraggly hairs. Axillæ joined.

Described from three males and eight females, reared from *Pseudococcus citri*. Sicily, 1913, H. J. Quayle.

*Types*.—Catalogue No. 19410, U.S.N.M.; four females on tags, a female and a male head on a slide. Four of the females are paratypes.

### 3. *Neanastatus orientalis*, n. sp.

*Female*.—Length, 3.00 mm. The head is lenticular in this genus.

Dark metallic purple, the fore wings deeply infuscated from a little beyond the base of the hairless line distad to apex (deepest under the stigmal and postmarginal veins). Abdomen with a yellowish-white cinctus at base. Head, pronotum except all margins narrowly, antennæ and legs (except the hind legs) golden yellow: proximal joint of hind tarsi white, rest black. Distal four tarsal joints of middle legs black. Mandibles tridentate. Funicle elongate, slender, over twice the length of the not long pedicel, narrowed at proximal third; funicle 2 somewhat shorter, four times longer than wide; 5 slightly longer than wide. Club subequal in length to

tuniele 1. In my table to the Australian species runs to *maximicarpus*, but differs in coloration. Body scaly. Hind tibial spur black.

From one female on a tag in U.S.N.M., labelled "Manila, P. I. Robt. Brown."

*Type*.—Catalogue No. 19411, U.S.N.M.; the above specimen plus a slide with the head, pair of wings, and hind tibiæ.

#### 4. *Neanastatus philippinensis*, n. sp.

*Female*.—Differs from the preceding in having the body (excluding appendages) entirely dark purple, except the band about the abdomen and the following: The proximal two joints of the hind tarsi are white; all of middle tarsi are yellow, like the first two pairs of legs; the antennæ are purple, and the infuscation of the fore wing is more accented under the distal venation. Head scaly.

From one female taken with the preceding.

*Type*.—Catalogue No. 19412, U.S.N.M.; the fore-described female on a tag.

## THE REARING OF LARVÆ.

By C. RIPPON, M.A., F.E.S.

(Concluded from p. 169.)

QUITE a number of species which hibernate as larvæ in nature can be made in confinement to feed straight up, pupate and emerge about Christmas or early in the New Year. The two necessary factors are warmth and suitable food. Some larvæ, such as those of *Triphæna fimbria*, will cheerfully accommodate themselves to cabbage leaves when the more usual food-plants are not obtainable; while potatoes, carrots, &c., are often useful as food substitutes during the cold weather. A suitable temperature is of course all-important, and it should on no account be allowed to drop very low even for a short period. One really cold night will start some larvæ hibernating, and nothing will then induce them to resume feeding. This forcing through of hibernating larvæ is only possible with certain species; others, whether kept warm or not, utterly refuse to go on feeding after a certain period of the autumn. With many hibernating larvæ it is not particularly difficult to bring them through the winter; but the problem is how to prevent them dying off when hibernation is over, which they often persist in doing, despite being supplied with the most tempting portions of their food-plant. When the latter is available sufficiently early, I have found that the best plan is to bring the larvæ into a warm, steady temperature about a month or more before they thoroughly wake up under natural conditions. I often begin to bring in hibernating larvæ in February with most excellent

results. This bringing in early applies equally well to some larvæ which hybernate full-fed, such as *Macrothylacia rubi*. I have certainly done best with that species when I have brought the larvæ into the warm in January. The reason why larvæ do better under this treatment may be that during the last few weeks of hybernation, under normal conditions, the warmer days wake the larvæ up, but before they get sufficiently wide-awake to feed properly, the cold night comes and makes them dormant again; this constant waking up without adequate feeding weakens them to such an extent that, when they do come properly out of hybernation, the usual drawbacks of rearing in confinement finish off all but the most robust. By bringing the larvæ in early and feeding in a steady warm (not hot) temperature, this weakening period is cut out and the larvæ are strong and healthy.

How soon it is desirable to bring the larvæ in (they should of course have at least two or three months of winter weather out of doors) depends largely on the food-plant. I have brought *Coremia quadrifasciaria* in as early as late January, but their food can be obtained at any time. To bring in larvæ only a week before they would thoroughly awake out of doors is an advantage, and this can often be easily managed even with larvæ which feed on trees or bushes. Suppose white thorn is the food-plant; then directly the buds swell and begin to show green, a small branch or two can be cut and placed in a vase of water in the warm. In a few days the foliage will be right out—perhaps ten days or a fortnight before it is out in nature. Some other deciduous trees and shrubs are amenable to the same treatment, and the breeder is thus enabled to bring in larvæ which feed on them ten days or more before they would out of doors be able to start feeding in earnest.

#### TREATMENT OF PUPÆ.

I have seen it stated in quite a number of works on the British Lepidoptera that the pupæ of burying larvæ should not be dug up, and that cocoons should not be interfered with. In the great majority of cases I would unhesitatingly advise the very opposite. In confinement many spinning larvæ will make their cocoons one on top of the other in such a way that if left in position the imagines could never get out of those at the bottom, while with those that bury I have already pointed out how one end or corner of the pupating box will be patronised by the majority of the larvæ. Then, again, despite the greatest care, insect pests may get established in the pupating material; and if the pupæ are left in it for months they may all be destroyed long before the perfect insects are ready to emerge. Another point about taking out the pupæ is that they are then much easier to handle and look after and to place, so that they



get the full benefit of the damp atmosphere which is so necessary to most species just before emergence. When in addition to this it is realized that the removal of the pupæ, if carefully done, does them no harm, and adds to the percentage of emergences, there seems no tangible reason left for leaving pupæ *in situ*.

I do not by all this mean that every cocoon should be opened and the pupa removed. As long as the cocoons are fairly substantial, there is no object to be gained by doing more than separating the cocoons one from the other, and removing the loose outer web if there is one. Indeed, from the difficulty of doing so without injury, it is unwise to attempt to remove pupæ from very tough cocoons, such as those made by the *Dicranura*. The old adage that the exception proves the rule was never better exemplified than in the treatment of Lepidoptera; and in connection with this question of the removal of pupæ or cocoons, there are some species whose pupæ *must* be left in the situation chosen by the larvæ. The species in which this is so necessary are generally those in which the pupa pushes itself partly out of its hiding-place just before the perfect insect is due to emerge, as, for example, in the *Sesias*. Then, again, many of the butterflies, and some species who spin above ground, require the pupæ to be suspended in some way, owing to the fact that their imagines prefer to hang from the pupa cases or cocoons while drying their wings. Care must be taken, in the removing of pupæ or burying larvæ and those which spin up on the surface of the ground, that they are properly formed and hard. Different species vary greatly in the time that elapses between going down and forming the pupa. With the generality of burying larvæ about a fortnight or three weeks is ample; but there are several species which rest as larvæ for a long time. The most notable of these are the *Xanthias* and *Xantholeuca croceago*, which do not change to pupæ till about a month before the imago is due to appear. To interfere with such species during the period of rest is generally fatal.

When dealing with larvæ whose period of rest is unknown, the receptacle in which they have gone down should be left untouched for a fortnight, then the compost in one corner should be gently removed till one of the insects is found; if it is a thoroughly hard pupa, the lot may be turned out with safety; if, on the other hand, it is still a larva, leave it, slightly exposed if possible, so that it can be inspected every few days. In this way the period of rest can be found out, and, at any rate, the breeder does not endanger the whole brood. The chief thing in keeping bare pupæ over any length of time is to prevent them coming into contact with anything that will block up their spiracles. They should never be allowed to lie on, or in, any dusty material such as dry earth. Bare pupæ and cocoons can

quite easily be kept during the winter piled into and shut up in chip or glass-topped boxes exposed to outdoor temperature.

About a month or more before the time arrives for the emergence of the perfect insect, the pupæ and cocoons should be spread out in shallow pans or boxes, the bare pupæ between two layers of sterilized moss, and placed in a cage or large well-ventilated box with rough sides and top. The atmosphere in this box should be kept decidedly damp, or many cripples will be bred, especially amongst the Geometers. The pupæ of many species do not all emerge the first year, a provision of Nature which has doubtless saved many an insect from extinction; but this class of pupæ does not seem to call for any special treatment, unless it be extra care in making sure a pupa is really dead before throwing it away.

#### IN CONCLUSION.

It will doubtless be noted that in the course of these jottings very little detailed description is given of such matters as exactly how to build a cage or how to obtain a desired condition—such, for instance, as the dampness in a pupa box. This sort of description has been purposely omitted, because its insertion would have unduly extended these notes, which are long enough already, and would have tended to distract the reader's attention from the main points, which are to reason out the why and wherefore of success and failure in the rearing of larvæ, and how the would-be successful breeder must vary the treatment according to the habits and peculiarities of the different species. There are several obvious ways of keeping pupæ in a damp atmosphere, and a description of exactly how I do it seems to me unnecessary. For somewhat the same reasons I have made no attempt to give the special treatment required for each individual species. A great deal of information on that subject can be got from many excellent works, such as Buckler's 'Larvæ,' Tutt's 'Practical Hints,' and that recently-published and useful 'Text Book' by L. W. Newman and H. A. Leeds.

Before concluding, however, it would perhaps be as well if I gave some indication of what I mean by such expressions as "considerable success," "excellent results," &c. To get through to the pupal state anything over sixty per cent. of larvæ bred from the egg I should consider a successful result; though I have got through eighty per cent. or more with smallish batches not exceeding one hundred, even with such things as *Catocala sponsa* and *C. lychnitis*. The latter, though, have generally been from small larvæ. The last time I bred them I got eighty-nine cocoons out of ninety-three larvæ, most of which were less than  $\frac{1}{2}$  in. in length when collected. As to the emergence of imagines, I should consider it a bad result if less than seventy per cent. of the pupæ failed to produce perfect

specimens. To illustrate this, I may mention that some time ago I kept a careful record of all the winter pupæ I happened to have that year. In no less than six different species every pupa hatched, and in no case did less than eighty-four per cent. emerge. With one exception the percentage of perfect specimens varied between seventy-three and one hundred. The one exception was a batch of *Taniocampa miniosa*, in which, though 90 per cent. hatched, only 63 per cent. were perfect, there being an unusual number of cripples, owing chiefly to the fact that the imagines came out with a rush a little before I expected them, and disturbed each other through being in too small a box.

Finally, I would point out that in the rearing of larvæ more than in almost any other scientific investigation, it is dangerous to place too much reliance on single experiments. Under certain circumstances, and particularly in the case of small numbers—twenty or under—it is sometimes possible to get through a single batch of larvæ without any of the treatment that is otherwise found to be specially required by the species dealt with. Single experiments, of course, have their value, but it is only by repeatedly rearing the larvæ of the same species, or of those closely related, that it is possible to make dependable deductions as to what factors conduce to the greatest success. Some entomologists, indeed, seem to be much too easily satisfied, and are apt to say that a certain species is quite easy to breed because they have once got a few through, without considering either the size of the imagines or their number in proportion to the original number of larvæ. To start with, say, two hundred larvæ and only get about twenty somewhat undersized imagines I should consider a failure, and only useful as a help in indicating what sort of drastic alterations in treatment would be needed at the next attempt.

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## GARDEN NOTES.

BY CLAUDE MORLEY, F.Z.S.

(Continued from 1914, p. 218.)

8. *The Flight of an Homopteron*.—The only time I have seen *Acocephalus nervosus*, Schr., on the wing was August 14th, when one flew across the east lawn in a curve round a cypress tree, and then at a considerable pace, though not fast (for an insect), and in a straight line—resembling the flight of the *Aphodii*—for some twelve yards, at about four and a half feet above the ground. At the time the air was calm and warm, with an extremely slight southerly breeze. That the vision of this species is not very keen while on the wing may be conjectured from the

fact that its career ended with a dash into a spider's web upon a rose bush.

9. *A Parasitic (?) Ephydrid Fly*.—My attention was attracted by a small insect on a dead willow trunk, which was walking about fairly fast and poking its nose into borings of the beetle *Ptilinus pectinicornis* (probably now tenanted by the Aculeate, *Trypoxylon attenuatum*). Once after such investigation she reversed, poked her tail into the mouth of the horizontal hole, and jerked it two or three times as though ovipositing. She then passed on to other holes, occasionally stopping to sharply jerk up her closed wings together; a movement very different to the vibration of the Ortalidæ. That the interest in these holes was quite definite is evidenced by the direct manner in which she walked from one to another, as well as by the fact that I twice frightened her away, and she at once returned and settled with no hesitancy, before I secured her. All on a summer-like day, April 23rd. Mr. Collin says the species is *Discocerina plumosa*, Flm., and that it is uncommon; it had every appearance of a Eurytomid Chalcid in its manner of investigation.

10. *Food-plants of Weevils*.—A fact of interest to rose-growers was noted on June 8th. I discovered *Anthonomus rubi* with its proboscis deeply embedded in an unexpanded bud of a small "Hiawatha" rambler rose, upon which it was certainly feeding, and so destroying the flower. This beetle more generally frequents flowers than is usually supposed; here I took it sucking *Matricaria inodora* in the middle of last August. Mr. Jennings has recently (Ent. Mo. Mag. 1915, p. 168) discussed the food of *Liophloeus nubilis*, without referring to my direct evidence brought forward in the fourth of these Notes, where the "Ground Elder" is *Aegopodium podagraria*; I suspect that his specimens from umbellifers were simply sucking the stylopods.

The *Hilara* of the third note is *H. monedula*, a new species, which will be described in Collin's forthcoming volume upon the British Empidæ.

(To be continued.)

## NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

### *Hypætra bipartita*, sp. n.

♀. Fore wings pale brown rufous tinged on basal two-thirds and greyish brown on terminal third; a black line or dot on costa near base; antemedial line indicated by three black spots, one on the costa and small linear below it, one below median nervure; post-medial line black, double, thickened on costa, sinuous; stigmata indistinct; the greyish terminal area inwardly limited by the post-



medial line is traversed by the black, undulated subterminal line; terminal dots black, fringes grey-brown. Hind wings greyish brown with traces of a dusky medial line and bands beyond. Under side fuscous; all wings have a dusky line beyond the middle.

Expanse, 48 millim.

Collection number, 939.

A female specimen from Kanshirei (1000 ft.), April 30th, 1908.

Near *H. noctuoides*, Guen.

*Oglasa costimacula*, sp. n.

♂. Head and thorax whitish brown, the latter freckled with darker brown; abdomen pale brown, edges of segments whitish. Fore wings whitish brown, sprinkled with darker brown; three black-brown spots on the costa, the first at base, the third about middle and somewhat triangular; five black dots on costa between third spot and the apex; antemedial and postmedial lines faintly indicated by blackish points; a black oblique streak from just above middle of postmedial line towards third costal spot; a large black-brown triangular patch, traversed by a pale brown curved line, on terminal area below apex; terminal dots black, white centred in triangular patch; fringes whitish brown freckled with darker, blackish brown at triangular patch. Hind wings whitish brown, suffused with fuscous chiefly on terminal area; traces of a dusky discoidal lunule and curved line beyond; fringes whitish brown. Under side of fore wings whitish brown, suffused on the disc with fuscous, and freckled with brown on the costal area: discoidal lunule and postmedial line blackish; fringes marked with blackish towards apex: of hind wings whitish brown, freckled with brown on costal area; discoidal dot and irregular dentate line beyond blackish; terminal line black, interrupted.

Expanse, 26 millim.

Collection number, 981.

A male specimen from Kanshirei, June 17th, 1906. A specimen also from Kanshirei (Wileman) is in the British Museum.

Near *O. retracta*, Hampson.

*Avitta taiwana*, sp. n.

♂. Head and thorax dark brown; abdomen pale brown, darker above. Fore wings dark brown tinged with violet-grey in certain lights; a black dot in the cell and one at the outer end of the cell: medial line black irregular, indistinct: postmedial line black, inwardly oblique except towards costa where it turns in: subterminal line black, undulated, preceded by a bluntly serrated line: fringes brown, ochreous at the base. Hind wings black-brown, fringes ochreous at base. Under side pale brown suffused with fuscous, chiefly on fore wings, all the wings have a dusky postmedial line and the hind wings a black discoidal lunule.

Expanse, 42 millim.

Collection number, 1896.

One example of each sex from Arizan (7300 ft.), March 3rd, 1908.

Allied to *A. puncta*, Wileman, from Japan.

*Adrapsa angulata*, sp. n.

♂. Head white, brownish in front; antennae serrate, with paired bristles; thorax white, patagia tipped with ochreous brown; abdomen white, ochreous tinged, barred with brown above. Fore wings white finely, dusted with ochreous brown except on terminal area: sub-basal line brown, broad and straight; antemedial line brown, broad, expanding above and below median nervure, nearer subbasal on dorsum than on costa; postmedial line ochreous brown, excurved round cell, slightly angled before dorsum; discoidal lunule ochreous brown; subterminal line brown, broad, slightly angled below costa and more strongly below middle, patches of brown scales beyond each angle extending to termen; lower portion of area between post-medial and subterminal lines filled in with ochreous brown; terminal line pale ochreous brown, diffuse; fringes white, marked with black at ends of the veins. Hind wings white with thin transverse brown lines, the first line broad and almost straight, the second outwardly bent about middle, the third broad and outwardly angled below middle, terminal line and fringes as on the fore wings. Under side similar to above but the discoidal spot of fore wings is black.

Expanse, 33 millim.

Collection number, 1462.

A male specimen from Arizan (7300 ft.), August 22nd, 1908.

Near *A. reticulata*, Leech.

*Mastigophorus nigrisigna*, sp. n.

♂. Head and thorax grey-brown freckled with darker, abdomen grey-brown. Fore wings grey-brown powdered with darker; a black dot in the cell and a black lunule at outer end of the cell, each outlined in ochreous; antemedial line blackish indented below costa, excurved from cell to dorsum; postmedial line pale but indistinct, slightly incurved towards dorsum; subterminal line whitish, sinuous, clouded with blackish on inner side; terminal line black, interrupted; fringes pale ochreous at base. Hind wings grey-brown suffused with darker; an oblique dusky line before the middle, and an irregular dusky band beyond the middle; terminal line black, interrupted; fringes pale grey, pale ochreous at base. Under side rather paler than above; all wings have black discoidal lunule and line beyond, that on fore wing is almost parallel with termen and is pale edged on costa, that on hind wing is followed by another less distinct line.

Expanse, 30 millim.

Collection number, 1016.

Two males, Kaushirei, June 19th, 1906, and August 11th, 1908.

Near *M. signata*, Butler.

*Mustigophorus punctilinea*, sp. n.

♂. Third point of palpi with tuft of reddish brown hair. Head and thorax pale brown, abdomen paler. Fore wings pale brown, clouded and suffused with darker; a black irregular spot at outer end of the cell, and a black dot in the cell; antemedial line blackish, sinuous, interrupted; medial shade dusky; postmedial line blackish, interrupted and marked with white on veins, inwardly edged with blackish on the costal end; terminal dots black, between veins. Hind wings pale brown suffused with dark fuscous, deeply on terminal area; discal lunule and serrated lines beyond black; subterminal series of white points on veins more or less connected by a dusky line. Under side pale brown, terminal area sprinkled with darker brown; all the wings have a black discoidal mark and two dusky irregular lines beyond, the outer line marked with white.

Expanse, 34 millim.

Collection number, 1464.

A rather worn male from Kanshirei, taken August 26th, 1907. Allied to *M. signata*, Butler.

*Nodaria (?) insipidalis*, sp. n.

♂. Head and thorax pale brown, abdomen rather whiter; antennæ fasciculate, distorted at one-third from base. Fore wings pale brown, sprinkled with darker; a blackish but indistinct discoidal mark, and traces of a blackish subterminal line only distinct towards apex; black dots between the veins on termen, fringes greyish brown. Hind wings whitish, sprinkled with brown towards tornus, traces of a diffuse blackish line towards tornus; terminal line black, interrupted; fringes grey, brown tinged. Under side whitish, flecked with brown, brown tinged on margin, all wings have black discoidal spot and subterminal line, the line on fore wings only distinct towards apex, and on hind wings is interrupted and most distinct towards tornus.

Expanse, 37 millim.

Collection number, 1739.

A male from Rantaizan (7500 ft.), May, 1909.

Comes nearest to *N. perdentalis*, Hampson.

*Lysimelia (?) bilineata*, sp. n.

♂. Antennæ fuscous brown, darkened at base, ciliated. Head and collar fuscous brown; thorax fuscous brown, mixed with whitish behind; abdomen pale fuscous brown, whitish at base. Fore wings fuscous brown with a diffuse whitish streak along costal area from middle of the base of the wing to the apex; postmedial and subterminal lines white, inwardly shaded with dark brown, almost parallel; fringes fuscous brown, preceded by a whitish line. Hind wings pale fuscous brown, inclining to brown on the costal area; subterminal line white, outwardly diffuse, inwardly shaded with dark brown; fringes as on fore wings but paler. Under side brown, dorsal area of all the wings whitish.

Expanse, 30 millim. ♂; 26 millim. ♀.

Collection numbers, 995 ♀ and 1421 ♂.

One example of each sex from Kanshirei; the male obtained July 21st, 1908, and the female, July 23rd, 1906.

Two examples (one from Ceylon, the other from Travancore) in the British Museum seem to be males of this species.

*Catada terminalis*, sp. n.

♂. Head and thorax whitish brown, collar darker brown; palpi whitish brown, tips of second and third joints black; abdomen whitish brown, terminal segments marked with darker brown. Fore wings whitish brown, finely powdered with darker; costa dotted with black and streaked with dark brown on two-thirds; a black dot near base of dorsum; antemedial line brown, wavy, not distinct towards costa; a black dot in the cell and another at outer end of the cell; postmedial line brown,肘ed above middle, inwardly shaded with brownish between cell and dorsum; three black marks on terminal area—one at apex and two about middle, the latter connected by dark brown scales; terminal dots black, not clear towards dorsum; fringes pale interrupted by blackish marks at apex and about middle. Hind wings whitish brown clouded with darker brown and sprinkled with black atoms on the terminal half; discoidal spot black, geminate, set in a brownish band which has irregular blackish edges; black chain-like markings on termen; fringes pale, marked with dark brown about middle. Under side whitish brown mottled with darker; all wings have black discoidal spot; fringes whitish, dark marked about middle.

Expanse, 14 millim.

Collection number, 1093.

A male specimen from Kanshirei, June 10th, 1906. There is a specimen also from Kanshirei (Wileman) in the British Museum.

Near *C. nigripuncta*, Hampson.

*Pilipectus taiwanus*, sp. n.

♀. Fore wings brown, reddish tinged on basal and tornal areas, faintly striated with white, veins paler; antemedial line white, sinuous, only distinct on the dorsal area where it is inwardly edged with dark brown mixed with reddish; the dorsal area enclosed by antemedial line is suffused with violet-grey; postmedial line white, interrupted, only distinct on costal area where it is outwardly inclined; discoidal spot white set in an almost round patch which is suffused with violet-grey and edged with dark brown; terminal lunules black, edged inwardly with white between middle and tornus; fringes grey, white at base and tips. Hind wings pale ochreous brown suffused with fuscous brown, fringes paler. Under side pale ochreous brown, discal area of fore wings clouded with fuscous, discoidal mark whitish; traces of a dusky postmedial band on hind wings.

Expanse, 38 millim.

Collection number, 1856.

A female specimen from Rantaizan, May 20th, 1909.

Allied to *P. cyclopis*, Hampson.



*Hypena indistincta*, sp. n.

♂. Antennae bipectinated, branches very slender, second joint of palpi long, third short apical tip pale. Fore wings pale brown, reddish tinged, obscurely mottled with blackish brown; postmedial line blackish, oblique, indistinct towards costa; subterminal and terminal lines indicated by white dots, the terminal most distinct; discoidal mark and spot in the cell dark brown. Hind wings fuscous, discoidal dot blackish. Under side whitish, the disc of fore wings and costal area of hind wings fuscous.

Expanse, 23 millim.

Collection number, 1452.

A male specimen from Rantaizan, March 21st, 1907.

*Naxos ochronota*, sp. n.

♂. Antennae serrate on inside, pectinate on outer. Fore wings greyish brown heavily powdered and suffused with blackish; reniform stigma ochreous, a black dot at lower end; orbicular stigma ochreous, punctiform, traces of postmedial line towards dorsum, very indistinct, subterminal line whitish, sinuous, a white dot at costal end, terminal line black, hinges dark grey, paler at base. Hind wings greyish brown powdered with blackish, traces of wavy black transverse lines on medial area. Under side whitish powdered with brown and suffused with blackish on terminal area of fore wings; all the wings have a black discoidal dot and wavy line beyond.

Expanse, 22 millim.

Collection number, 1328.

A male specimen from Kangshirei, April 18th, 1908. One male, also from Kangshirei (Wileman), in the British Museum.

Allied to *N. symethusales*, Walk.

(To be continued.)

## NOTES AND OBSERVATIONS.

THE BUTTERFLIES OF THE TAUNTON DISTRICT.—Mr. W. B. Butler in the May number asks whether his extensive list of the butterflies to be found in the Taunton district can be exceeded in a district with similar limits—ten miles from a centro. Some years ago, whatever it may be now, the butterflies of the Marlborough district, with a similar radius, comprised all those mentioned by Mr. Butler with the exception of *L. egeon*, and in addition *C. hyale*, *E. antiope* (once), *G. ealtham* (not resident), *A. iris*, *L. sibylla*, and *H. comma*. Of these, *iris* and *sibylla* have not occurred, I believe, for some years, and *sinapis* is no doubt extinct, unless it has turned up again since I last visited my old hunting-grounds about ten years ago. It is interesting to note that *T. wallana* was first recorded in, I think, 1873, and became fairly common for some years, but has now become rare. *M. aurora* disappeared about 1865, and did not occur again until about 1903, when a few stragglers appeared; now in one locality at least it is fairly common. I cannot account for the disappearance of *A. iris*, except that in one of its two localities

the willows have been cut down. I think the horrible summer of 1870 had much to do with its extermination, and also that of *L. albigata*.—N. MANDERS, Colonel, A.M.S.; The Dardanelles, June 14th, 1915.

HIBERNATED EXAMPLES OF *VANESSA ANTIOPA*.—The capture last May of a specimen of *V. antiopa*, as recorded by Mr. W. H. Smith in the 'Entomologist,' p. 169, is of considerable interest, as hibernated specimens of the species are but very rarely met with in this country. The paleness of the colouring of the marginal bands alluded to is entirely due to fading of the yellow pigment. As most of the examples taken in Britain have been more or less worn, the borders are usually pale in colour; but individuals with straw-yellow borders have from time to time been captured. In my series of ten British caught specimens two possess yellow borders: one of these was taken by myself at Chatham on August 22nd, 1893; the other captured in August, 1901, at Rayleigh, Essex. I may add that my series contains two hibernated examples, one taken from the trunk of a birch tree near Box Hill, Surrey, on April 17th, 1881; the second one is of much interest, and which I have been fortunate in securing quite recently. It was taken as long ago as February 25th, 1863, by a gamekeeper named Matthew Barrone in a plantation near Castle Eden, Durham, as "it crept out from amongst some grass by the side of a fire," as recorded by Mr. Frederic Raine in the 'Entomologist,' vol. iv. 1869, p. 250. Mr. Raine informed me many years ago of this particular *antiopa* (but could not remember when or where he recorded the fact), as he obtained it from the gamekeeper and afterwards gave it to the Newcastle Museum.—F. W. FROHAWA; July, 1915.

THE FOOD-PLANT OF THE LARVA OF *HYRIA MURICATA*.—As Garrett states ('Lepidoptera of the British Islands,' vol. vii. p. 329), the food-plant of the larva of this insect in a wild state is apparently unknown both in England and on the Continent. Mr. W. Holland, who has recently been collecting for me in a locality where this insect is very abundant, tells me that he is certain the larva feeds on the Marsh Cinqufoil (*Plantilla palustris*). Although Mr. Holland did not find any larvae, nor did he observe females depositing on this plant, he told me that the insect only occurred among it, and was not present in those portions of the marsh where the plant did not grow.—N. CHARLES ROTHSCHILD; Arundel House, Kensington Palace Gardens, W.

LIMBETTES ABYSSA AT WORCESTER.—As I was walking along the Severn quay at Worcester, and immediately below the cathedral wall on Sunday, July 25th, I was surprised to see an example of this butterfly settle on a plant close to the water's edge. It seemed to have descended from the college garden; but I think the appearance of the insect right in the city is worthy of note, especially as Newman's comment on Maindon's "Worcester" as a locality is—"my entomological correspondent at Worcester, who has taken the utmost pains to supply me with information, does not confirm this report."—H. ROWLAND-BROWN; Harrow Weald, July 26th, 1915.

HIBERNATION OF *PERONEA SPONSANA*, Fab.—In view of the fact that this is a late autumnal species, the congeners of which are known to hibernate, it is somewhat remarkable that no observations concerning its occurrence in the spring should, so far as I am aware, have been placed upon record. Barrett states (Brit. Lepidop. vol. 10, p. 237):—"On the wing from July to October, apparently without hibernating." It may be of interest therefore to record the capture of three rather worn specimens of this species on May 25th. They were beaten from beech at Ranmore Common, Surrey. I may add that from Scotland I have records of this moth coming to light in November.—R. MELDOLA; 6, Brunswick Square, W.C., July 6th, 1915.

MELANARGIA GALATEA IN THE CHILTERNs.—*A propos* of my remarks about this species (*antea*, p. 142), I am pleased to say that this year I have had the pleasure of taking *M. galatea* for the first time in my experience in this region, at a spot about midway between Wendover and High Wycombe. On July 4th I was walking over a piece of grassy down which I have long suspected as a possible haunt of the species, when a lately emerged female suddenly rose from under my feet. Unfortunately the sky had become overcast, and though I quested the locality for an hour I did not see another example. *Argynnis aglaia* was commoner (all males) than I have ever seen it hereabouts; but there were no *A. adippe*. *Aglaia* does not seem to require hot sunshire to stimulate activity.—H. ROWLAND-BROWN; Harrow Weald, July 5th, 1915.

USE OF A FUNGUS IN ENTOMOLOGY.—A reference to the use of the birch-tree fungus (*Polyporus betulinus*) in mounting Micro-Lepidoptera appears in the May number of the current issue of the 'Entomologist,' p. 127. It reminds me of the first "butterfly-cabinet" I ever saw—more than sixty years ago—and it did credit to the amateur who made it and filled it with specimens, chiefly local. The drawers, made of white deal, were neither papered nor corked. Instead of the latter, narrow strips of this dried fungus—cork-like and snowy-white—were glued to the bottoms. The difficulty of arranging the strips so as to suit the different sizes of insects was, with a little forethought, easily got over; and I have no recollection that my old friend was ever troubled with mites. This fungus, when dried and cut into strips of the required thickness, was often used in those days as razor strops.—J. ARKLE; Chester.

AN INTERESTING VARIETY OF *ARCTIA CAIA* FROM SALTLEY DISTRICT.—I should like to record a variety of this insect which was brought to me by a friend of mine on July 6th. The specimen is a female, the upper wings being of uniform chocolate colour without a trace of white, the under wings being of the same colour, thickly fringed with tawny-coloured hair on the inner edges, the usual black spots being present on the under wings, showing up clearly on the chocolate. The body is absolutely normal, being of a red colour with black bars, the hair on the thorax being chocolate as usual. Unfortunately, as too often happens in the case of "varieties," the under wings are slightly undeveloped, the right wing, when pinned out, being about seven-eighths the usual size, and the left wing about

five-eighths; altogether it is the nearest approach I have seen recorded up to the present of a melanic specimen of this variable species, although the Saltley district is fairly well known for producing varieties.—J. H. GRANT; Birmingham.

## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—June 10th.—Mr. A. E. Gibbs, F.L.S., Vice-President, in the chair.—Dr. Chapman exhibited a living specimen of *Polyommatus escheri*, bred from ova from Gavarnie, Pyrenees. It was of the form *rouloui*.—Mr. Hy. J. Turner, the whole of the coloured plates of the ten volumes of Herbst's 'Natarsystem,' Coleoptera, 1783–1804, which he had bought for a few shillings from a street barrow.—Mr. B. S. Williams, aberrations of *Sclenia bilunaria* (*illunaria*), a very strongly marked female and a smoky male: larvæ of *Anticlea badiata*; and aberrations of *Agrotis nigricans*, a red-brown form from Wicken, and a black form from St. Anne's. He also reported that he had heard *Hylophile prasinana* make a distinct, peculiar buzzing noise when in flight at night as it came to his lantern light.—Mr. Dennis, photographs with the stereoscope of *Hispidula atra* and *Formica pratensis*, with sprays of laburnum and spiræa.—Mr. J. P. Barrett, a living specimen of *Strymon pruni*, which had emerged on June 10th. It was considered an early date.—Mr. Dunster, a series of *Brenthis euphrosyne*, taken in Bucks in May.—Mr. Bunnett, examples of *Mygale aviculare*, with photos of the same.—Mr. B. Adkin, series of local forms and aberrations of *Ruralis betulae* and *Pachygastria trifolii*, and read notes on the exhibit. Of the former species he showed a unique aberration with an orange border to all the wings and much orange suffusion.

June 24th.—Mr. B. H. Smith, B.A., F.E.S., President, in the chair.—Mr. Fagg, of Lewisham, was elected a member.—Mr. Edwards, for Mr. Dawson, exhibited several remarkable aberrations of European butterflies, including *Polyommatus icarus*, with elongated marginal markings on under side; *Melitæa dictynna*, with under side fore wings, all markings blurred, and hind wing markings extensively radiated, the upper side almost wholly black suffused; a melanic *Brenthis pales*, a zanthic form of *Epinephele jurtina*; *Polyommatus hylas*, with very pale marginal area on under side, and *Melitæa didyma*, with radiated under sides. He also showed nests of the humble-bee, *Bombus lapidarius*, with imagines from Worcestershire.—Mr. West (Greenwich), the principal species of Coleoptera taken by him in late May and early June in the New Forest, including *Leptura scutellata*, *Mesosa nubila*, *Clytus arietis*, *Grammoptera preusta*, *Elatér sanguinolentus*, *E. minutus*, *Agrius viridis*, *Colydium elongatum*, *Aphodius niger*, &c.—Messrs. B. Adkin, R. Adkin, Hy. J. Turner, A. E. Gibbs, and Cowham, series and specimens of *Lasiocampa quercis*, and Mr. B. Adkin subsequently read a paper on the species.—Mr. Gibbs, a male with complete female coloration.—Mr. Cowham, a female from Epsom, which was two years in pupa



and had emerged in May. It was of the var. *calluna*. Another example had the discoidal on the left fore wing duplicated.

July 8th.—The President in the chair.—Mr. G. B. Pearson, Russell Square, W., was elected a member.—There was a special exhibition of *Malacosoma neustria*, *M. castrensis*, and *Cosmotriche potatoria* by Messrs. B. Adkin, R. Adkin, S. Edwards, A. E. Gibbs, Leeds, Sperring, and Brooks, which included series of numerous local races and many aberrations. Mr. B. Adkin then read a series of notes on the variation attainable in the three species.—Mr. B. S. Williams exhibited a bred series of *Bupalus piniaria* from Leith Hill.—Mr. West (Ashted), examples of *Triena psi* and *T. tridens*, and asked if members could point out definite markings whereby the imagines could be correctly distinguished.

LONDON NATURAL HISTORY SOCIETY.—February 16th, 1915.—Mr. W. E. King exhibited a series of under sides of *Hipparchia hyperanthus*, including one ab. *lanceolata* and several ab. *cæca*.—Mr. J. A. Simes, some Spanish butterflies, including *Thais rumina*, *Euchloë euphenoides*, *Zegris eupheme* var. *meridionalis*, *Charaxes janius*, *Dryas pandora*, *Melanargia syllius*, *M. ines*, and *M. lachesis*, *Agriades thersites*, *Nomiades cyllarus*, *Lycæna hylas* var. *nivescens*, *Cænonympha iphioides* and *C. dorus*, *Plebeius zephyrus* var. *hispanica*, and var. *lycidas*.—Mr. A. J. Willsdon, *Dasycampa rubiginea* from Bournemouth, Hereford, and Torquay, the Bournemouth specimens being lighter than the Hereford ones and the Torquay more reddish; also a fine variety from Torquay.—Mr. J. A. Simes read a paper entitled 'A Month amongst Spanish Butterflies.'

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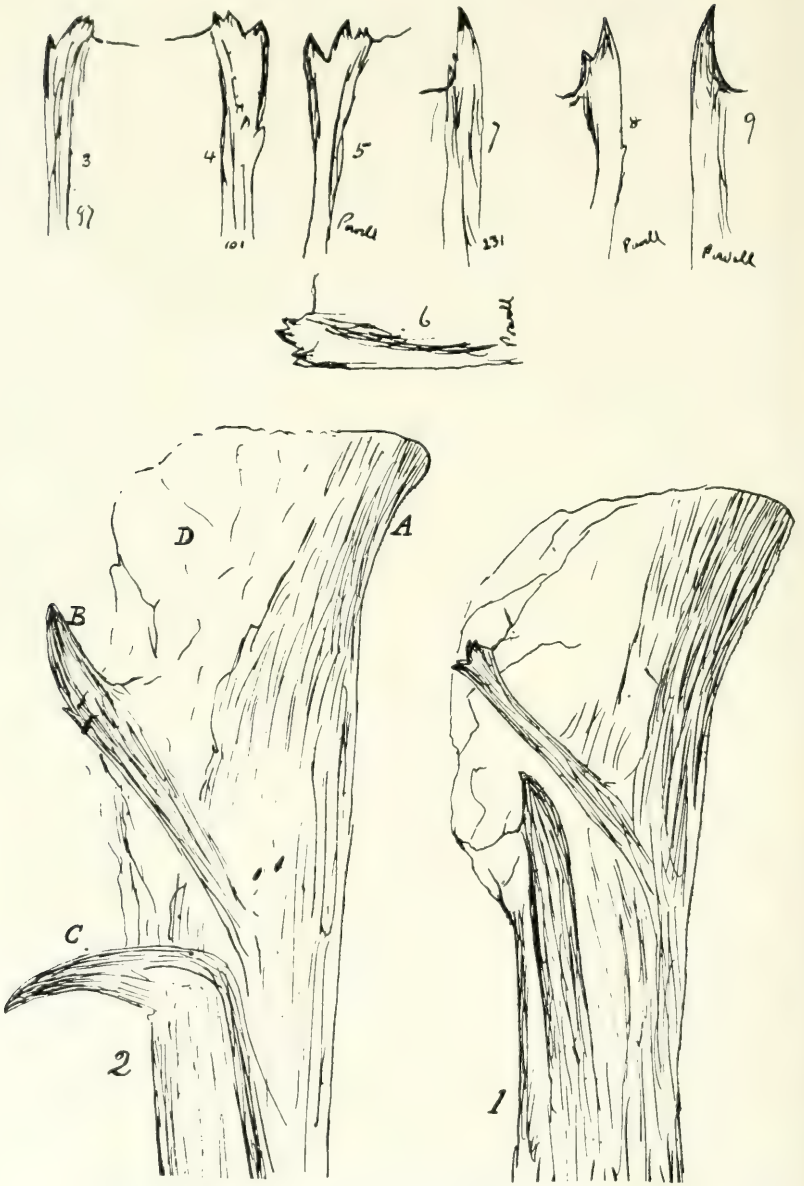
## OBITUARY.

### WILLIAM HOWLETT.

There died on June 8th one of the oldest naturalists of Suffolk. For many years Howlett had been a barber and taxidermist in Newmarket High Street, to whom the district brought all sorts of natural history objects to be named, and he was locally widely known; but for the last thirteen years he had retired to a cottage in Barton Mills, some ten miles away and always a favourite hunting-ground of his. He had been captain of the old Newmarket fire brigade, as well as for long an official of the Lark Angling Society and the Barton Mills Conservative Association. Besides these diverse interests, he was especially interested in the animals, birds, fishes, and butterflies of the district, in the habits of which he was, as a self-educated man, laudably proficient. We well remember him at the Barton 'Bull' in the old days when Mr. Howes was host in 1899, before the hotel was renovated for motorists (a new wing was added last winter), and here he actually expired of heat apoplexy, while in search of stamps to forward natural history or piscatorial articles to the 'Bury Free Press,' to which and one or two London papers he contributed. Few knew the Suffolk Breck and Chalk Vertebrate Fauna better than Howlett.

CLAUDE MORLEY.





CAMERA SKETCHES OF PORTIONS OF AEDAEGUS OF *Thecla ilicis*,  
*T. aesculi*, AND *T. spini*.

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## SOME REMARKS ON *THECLA ÆSCULI*, HB., CHIEFLY IN THE SOUTH OF FRANCE.

BY H. ROWLAND-BROWN, M.A., F.E.S.

(PLATES IX. AND X.)

IF successful this year (1915) in rearing the two Theclids with which this paper is principally associated, I had hoped to write a life-history of both species from personal observations, assisted by those of my correspondents Mr. Harold Powell, of Hyères, and Mr. Charles Morris, of Le Cannet. Unfortunately the war has put an end to all foreign travel for the time being, even if opportunity served to bring the matter to a definite conclusion. The following notes were already put together before August, 1914; and Mr. Rayward, to whom Mr. W. G. Sheldon kindly communicated some of my specimens for making preparations of the appendages, reported them ready soon after that date. The excellent photographs by Mr. E. M. Montgomery were then submitted to Dr. T. A. Chapman for his opinion, which follows with his notes, and thanks to him also I am enabled to present the accompanying line drawings further to elucidate Mr. Rayward's studies by comparison with the structures of another member of this particular group.

So far as I am concerned, the life-histories in contemplation will have to wait until western Europe is again open to the British field naturalist. The scientific value of these remarks, therefore, rests entirely with the reports of the gentlemen who have so ably carried out the examination of the respective male appendages.

Hitherto, collectors at home and abroad do not appear to have realized that in *Thecla* (or, as Tutt insists, *Nordmannia*) *ilicis* and *T. æsculi* we have two distinct and separate species. This is all the more strange when we refer to the early authorities, and find them almost unanimous on the subject. Nor is it until the German writers of the later nineteenth century that the confusion begins which has existed ever since.

I notice that Mr. B. S. Curwen in his interesting account of "Early Summer in the Valais and North Italy" ('Ent. Record.'



xxv. p. 300, &c.) once more enumerates *Ilicis* and var. *Æsculi* among his captures at Eclépens. For the benefit, then, of those who, following the text-books of Kane, Wheeler, and others, have hitherto arranged these butterflies in their collections under the same label, I venture to offer a few remarks intended to help them to distinguish *Æsculi* as well in the museum as in the field.

Of the earlier lepidopterists, Hübner, who is responsible for the nomenclature, Ochsenheimer, and Godart all give *Æsculi* specific rank. Boisduval, in his 'Index Methodicus' (1829), classifies thus :

"*Æsculi*, H., Och., God. (vix a seq. diff.) . . . Gall. mer. . . . Junii";

thus indicating his belief in the species, though scarcely differing from the following, which is

"*Lynceus*, F., God. . . . Europ. . . . Junii.  
*Ilicis*, H., Och."

Twenty-four years later, Gerhard, also, figuring the genus, maintains this separate identity, and is followed by Segond ('Cat. des Papillons du Var.,' 1853), Bellier de la Chavignerie ("Lépid. des Pyr.-Or.," 'Ann. Ent. Soc. France,' 1857), and de Graslin ("Lépid. des Pyr.-Or., loc. cit. 1862), all of whom I cite as having had personal knowledge of the butterfly in its native haunts. Then, about 1863, M. Oberthür tells us ('Lépid. Comparée,' fasc. iv. pp. 75-79) Guenée attached to the box, now in his possession, containing examples taken in the Eastern Pyrenees, the following screed, written in his exquisite and microscopic handwriting:—

"*Thecla Æsculi*, Hb., 559, 560; Och.; God., Enc., p. 649; De V. et Gn., p. 40—taken by me at le Vernet in 1859; June and July. Can it be believed that this species, so distinct, is not accepted by the German authors, even the most modern, who insist upon regarding it as a variety of *Lynceus* (*Ilicis*)! It is as common at Montpellier as *Lynceus* (*Ilicis*) with us, and the latter occurs there also, and never mixes with it. Further, the var. *Cerri*, to which almost all the examples from the Midi belong, is exaggerated in the contrary direction to *Æsculi*. The general appearance, the entire absence of the tawny blotches in both sexes, the shape of the white line of the hind wings and of their tawny lunules, the absence of the terminal border, the club of the antennæ, &c., should leave no doubt of the specific validity. The larva feeds on *ilex* (*yeuse*), and closely resembles that of *Lynceus* (*Ilicis*). I bred No. 4; the pupa-case is beside it."

M. Oberthür then proceeds to examine the three hundred and seventy-four *Æsculi* in his collection from S. France, S. Spain, and Algeria. Both sexes, he says, are uniform dark brown on the upper side, but occasionally the female shows a trace of tawny on the fore wings above, and several spots of the same

shade along the marginal border of the hind wings. In Spain, Algeria, and the Eastern Pyrenees there occurs with the type the variety of which Hübner figures the female with Nos. 690, 691. It is this *Æsculi* which is erroneously cited by Staudinger ('Catalog,' 1901) as a synonym of *Cerri*. In this variety (*Æsculi*, Hb., female, 690-691) the male is unicolorous above, but the female is ornamented on the extra-cellular part of the fore wings with a broad tawny blotch, and along the border of the hind wings with a very well-developed border formed of similar tawny confluent spots. Gerhard figures this var. of *Æsculi*, and gives to it the name *Maculatus* (pl. 4, fig. 4). "I do not know why this var. *Maculatus*, Gerhard, is not recognized in the 'Catalog.'" And, as far as the *Æsculi* of south-western Europe is concerned, M. Oberthür reclassifies them as follows ('Lépid. Comparée,' fasc. iv. April, 1910, pp. 78-9):—

- "1. ♂ and ♀ practically unicolorous on upper side.  
*Æsculi*, Hb. . . . (♂ 559-560) . . . S. France.  
*Æsculi*, Gerh. . . . (Pl. 2; figs. 1a, 1b, 1c). Portugal.
- "2. ♂ unicolorous upper side, ♀ with tawny blotches on all four wings upper side.  
*Maculatus*, Gerh. . . . (Pl. 4; ♀, fig. 4) . . . Andalusia; Collioure, Pyr.-Or.  
*Æsculi*, Hb. . . . (♀ 690, 691).  
 ab. *Graslini*, Obthr. (♂ Lép. Comp. iv. pl. xlix. fig. 402). Sierra Nevada.
- "3. Unicolorous upper side; deep blackish; rather large; the red tawny spots very brilliant.  
*Ilicioides*, Gerh. . . . (Pl. 4; figs. 5a, 5b, 5c) . . . Ronda."

Meanwhile, the German authors, ignoring Gerhard, continue to refer *Æsculi* to *Ilicis*, including Staudinger, and Rühl, who gives so clear an account of the superficial differences of his type and so-called variety that it is surprising he did not suspect the truth. And it is certainly as surprising to find that M. Rondou follows their example ('Cat. Lépid. des Pyrénées, Soc. Linn. Bordeaux,' t. lvii. 1902). Even as recently as the year before last Professor Courvoisier ('Internat. Ent. Zeitschrift,' Guben, No. 36, p. 240, December 6th, 1913), in the course of a long paper on the "Nomenclature and Diagnosis of the European Theclids," repeats the error, *Æsculi* (*sic*) still appearing under *Ilicis*, though the several forms of it are correctly differentiated from the forms of *Ilicis*, as (c) *maculatus*, Gerh. (*vide supra*), (d) *mauretanicus*, Stgr., and (e) *aureonitens*, Seitz, described as a common form of the female *Mauretanicus* with a lustrous golden upper side.

M. Oberthür, then, renders us real service by once more calling attention to this long drawn-out tale of misrepresentation. Before, and until I visited Rennes in 1909, and he emphasised

the fact when showing me his collection, I, too, had not examined my Digne and Vernet *Æsculi* with sufficient care to realize that they were in effect other than a form of *Ilicis*. Nor am I the only collector, it appears, who, having come across the two species, or *Æsculi* alone, accepted the lead of Staudinger, despite the obvious fact that his acquaintance with most of the more local French species is slight, and usually secondhand. Mr. F. Bromilow ('Entomologist,' vol. xxvi. p. 348) ranks the species as a variety, "first seen on June 30th" at Nice; Mr. F. Norris (*loc. cit.*, vol. xxv. p. 240), in the same way, at Certosa di Pesio, "not at all rare." But, as might be expected of so experienced a lepidopterist as the Rev. F. E. Lowe, he expresses a decided doubt as to the specific identity of the two butterflies in Spain. Collecting at La Granja, near Madrid, he writes ('Ent. Record,' xxi. 1909): "Flying with the usual form were some very small *N. ilicis* of var. *æsculi* quite dwarfs (I have the same from Eclépens). It seems difficult to believe that this is really *N. ilicis*" (p. 63); and again "*N. ilicis* and vars. *cerri* and *æsculi*, very abundant, partial to acacia trees; is it possible that it even lays its eggs on them?" (p. 65). Mr. A. H. Jones also mentions "var. *æsculi*, worn specimens at Grenada, beginning of May" (*loc. cit.* xxiii. p. 297). At an earlier date still Mr. W. E. Nicholson speaks of "this form, with *T. pruni* at Budafok," near Budapest. Even so punctilious an authority as Mr. G. T. Bethune-Baker retains *Æsculi* as a local form of *Ilicis*, I believe, and it is because of this view especially that I have gone into the matter at so much length.

To revert to Godart ('Hist. Nat. Pap. France,' t. ii. pp. 162-163), we find the superficial differences of the two butterflies succinctly stated. *Æsculi* is his Papillon du Marronnier, and he records it in the garrigues of the Midi in springtime and in summer; though this must mean that it occurs in June and July, as it seems to be a single-brooded species in common with the other members of the genus. In such localities, he adds, it is always smaller than *Ilicis*; the under side of a less dark brown, or approaching to grey (I should call it cinnamon); the ante-marginal spots of the hind wings are more vivid in colour (red-orange, rather than yellow, as in *Ilicis*), smaller, and consequently further separated from one another. But the difference is even more apparent in the shape of the inner line of white spots on the under side, which are not, as a rule, as in *Ilicis*, continued even faintly on the fore wings. Godart rightly describes the spot which touches the inner margin toward the anal angle as in the shape of a reversed C, or crescent, and the next one to it as almost upright (*droit*), while in *Ilicis* the first spot is V, or chevron-shaped, and very clearly so. "What leads me further to suppose that the *Polyommatus* of the chestnut is not merely a local variety of *Lynceus* (*Ilicis*), is that the latter

occurs also in the Midi, where it is precisely similar to the form of our central and northern departments."

The plates in Godart's work are mediocre. On plate xxi. figs. 3, 4, the white line of the under side is carried from the centre to the apex of the fore wings, and the colouring is very poor—certainly not realizing the description, "tirant sur le gris." Herrich-Schäfer follows Godart closely.

The markings, then, differ conspicuously in the shape and direction of the white line of spots; bowed in *Æsculi*; more upright in *Ilicis*. But, as I have said, the chevron shape of No. 3 spot is the easiest character by which to distinguish the species in all other, I think, than the extreme Spanish forms. As to the form *Ilicioides*, Gerh. (which Courvoisier (*loc. cit.*) entirely ignores), the under side of the female examples examined by me suggest *Æsculi* so much more forcibly than *Ilicis* that there should be no difficulty in separating them, even though the blotches on the fore wings of the male are suggestive of *Ilicis* var. *cerri*.

The habits of the two butterflies are also different in degree. While *Ilicis* is widespread over the greater part of France, *Æsculi*, so far, has only been reported with authority from the southern departments. Mr. Powell (*in litt.*) writes: "We get both species at Hyères—*Ilicis*, in the form of *Cerri*, about the middle of May, and *Æsculi* in the cork and ilex woods towards the end of that month"; and he adds, "All specimens I have seen from Spain and Algeria are forms of *Æsculi*."

My own specimens, taken at Digne and Le Vernet, in the Eastern Pyrenees, bear out the evidence of Mr. Powell, and I might add that, whereas *Ilicis* seems to have a penchant for settling on field flowers or stonecrop on walls, *Æsculi* is more often taken flying over low bushes, or at rest on bramble blossom.

M. Charles Oberthür reports the occurrence of *T. ilicis* throughout France; and the local catalogues in my possession bear out his observations; the number of Departments right up to the Channel in which it has not been recorded being few in number.

The typical *T. æsculi*, on the other hand, so far has only been notified from the following, nearly all of them in the Midi:—Alpes-Maritimes: Millière, who classes the species as a constant variety with var. *cerri*, describes both as less rare than the type; Col de Castillon (Oberthür); St. Martin-Vésubie; Vallon des Fleurs, Vallon Obscur, Nice; first seen June 30th (Bromilow). Aude: Bois de l'Alarie, very abundant (Mabille). Basses-Alpes: Digne, in addition to my own captures, reported as common by Mrs. Nicholl; Les Mées, on the left bank of the Durance opposite St. Auban (Donzel). Basses-Pyrénées: throughout (Larralde), though I have a suspicion that this



author means *T. ilicis*. I took no *Æsculi* at Biarritz and Guéthary. Bouches-du-Rhône: Vallon des Crides, Col de Bretagne, very common (Siepi); Fontvielle, July 19th–21st, 1912 (F. E. Lowe). Drôme: Nyons, beginning of July, 1911 (Rowland-Brown). Gironde: Pessac and Bouliac (Trimoulet). Haute-Garonne: occurs in the same localities with *Ilicis* up to 900 m. (Caradja). Indre: Gargilesse, rather rare (Sand); a somewhat doubtful identification I should think. Lozère: specimens in the Fallou collection at Paris from Florac; and I have taken it there also. Maine-et-Loire: described as rather rare by the late M. Delahaye, this being the most westerly and northerly locality where it has been observed. Pyrénées-Orientales: Le Vernet, very common (Bellier, and many others); the only "form" at Sorède (Spröngerts); Collioure, and generally (Rondou). Var: (Segond), probably Draguignan; Hyères (Powell); Ste. Baume (F. E. Lowe).

Lastly, it may be of interest to add that, while M. Oberthür, on Guenée's evidence, mentions *ilex* (*yeuse*) as the one food-plant of *T. æsculi*, Rouast ('Catalogue des Chenilles Européennes connues,' Lyon, 1883), quotes *Ulmus campestris*, *Acacia*, *Quercus robur*, and *Q. ilex* for *T. ilicis*, on the authority of Donzel, and *Q. coccifera*, April, on that of Martorell. To these M. Frionnet adds *Æsculus hippocastanum*; and M. J. de Johannis ("Lépid. du Morbihan," 'Ann. Soc. Ent. France,' 1908, p. 703), blackthorn.

In the 'Entomologist' for 1892 (vol. xxv. p. 193) Mr. F. Bromilow describes a series of bred *T. spini*, among which appeared to be two hybrids with *T. ilicis*. In a subsequent note (*loc. cit.* p. 291) he revises this opinion on the ground that the supposed hybrids were no more than examples of var. *Lynceus*. This second note has evidently been misinterpreted by M. Frionnet, for, in his book on the earlier stages of the butterflies of France ('Prem. États des Lépid. p. 87), he quotes Mr. Bromilow as the authority that *Ilicis* sometimes pairs with *Spini*, while he makes no distinction at all between *Æsculi* and what he conceives to be the type thereof.

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## EXPLANATION OF PLATE IX.

WITH REMARKS THEREON, BY T. A. CHAPMAN, M.D., F.Z.S., F.E.S.

Mr. Rowland-Brown asks me to revise, if necessary, some remarks on *ilicis* and *æsculi*, which I wrote to Mr. Rayward last March, with a view to his adding them to his article on these species. I think they may very well go as they are, but I have taken the opportunity again carefully to go over my specimens with the object of trying to make a point or two clearer to myself if to no one else. I find I may confine the results of this inquisition to giving some details as to the process of the aedeagus that Mr. Rayward regarded as belonging to the system of "cornuti," in which

I appear to have agreed with him, without very careful consideration. It is, however, a part of the solid ædeagus, and it forms a portion of the extremity of the organ, from which the vesica begins to evert.

Nevertheless, I believe Mr. Rayward and myself were so far right that, though not moveable with the eversible membrane, but fixed to the tube of the ædeagus, it is morphologically as much a cornutus as a portion of the ædeagus proper. The *ductus* may be chitinised more or less and in different forms, so that it is, in a sense, accidental whether some particular portion of the *ductus* be solid ædeagus or eversible membrane (with or without "cornuti"), or, as here, present a somewhat ambiguous intermediate condition.

The little group of Theclas to which it belongs have a very similar structure, varying of course a good deal in details and in the proportion of parts.

In the rough sketches from camera outlines of these parts in *T. spini* and *T. ilicis* it will, I think, be clear, that the end of the ædeagus divides into three chitinous processes. I have selected *T. spini*, instead of any other species, to illustrate this, as it seems nearer to *ilicis* and *æsculi* than any of them. I have selected specimens in which the three processes happen to diverge considerably. This is probably due to pressure of the specimen in mounting, and may be an attitude assumed when the organ is in use, but I fancy in an ordinary position of rest the three processes are more parallel to each other (as in Plate IX.). The other allied species, as judged by the structure of the ædeagus, are almost resolved into *acaciæ* only, in which the structures B and C are very similar to each other, not unlike C as formed in *ilicis*, but both with much longer free portions.

*Acaciæ* associates itself with *ilicis* and *æsculi* in having both these processes (B and C) apparently solidly attached to the chitinous cylinder of the ædeagus. In *pruni*, the other species apparently belonging to this group, there is what is almost a fundamental difference. The two processes, if we are so to recognise them, in *pruni* are not solidly attached to the ædeagal tube; but are movable with the vesica, and might be called cornuti, so nearly so as to quite excuse the mistake of at first believing them in *ilicis* to be cornuti. It is difficult to doubt that the two processes in *pruni* are homologous with those in *ilicis*, yet B is a small spiculate piece attached to the vesica, with the solid stem, as seen in *ilicis*, reduced to quite a soft membranous ribbon; C is larger, and has a slender stem unattached to the ædeagus proper. Both protrude with the vesica and separate from each other, but maintain when everted the same direction as when at rest, *i. e.* their spicules continue to point outward, and are not turned round so as to point inward as in typical cornuti. When at rest both spicular bodies lie closely together in the centre of the ædeagus near its extremity.

Fig. 1 represents *ilicis*; I have not given *æsculi*, since it differs from *ilicis* only in the extremity of the process I have marked B.

Fig. 2 represents *spini*; A is the extremity of the tube of the ædeagus; the edge of what appears as the free surface (against the letter A) has extremely fine spiculations in all these species. B is the process that, in *ilicis* and *æsculi*, affords the differentiating specific characters. C is a process that, in *ilicis* and *æsculi*, has the appearance in most preparations of a flat plate with a lancet-shaped end lying flat within the ædeagus. In fig. 1 it is seen rather sideways, and shows that it has an external free margin. D is a portion of the eversible membrane (vesica), partially extended and exposed, in accordance with the apparently corrected positions of processes B and C. Normally at rest these processes are probably parallel with the axis of the ædeagus; C, fig. 2, is obviously in a specially everted position.

The process B of fig. 1 (letters are placed on fig. 2) is the one in which there is a definite difference, apparently constant, between *ilicis* and *æsculi*.

My original difficulty with regard to feeling clear as to what the difference

between the two species consisted in, was that no two specimens seemed exactly alike and that the number of points was very various, and it seemed difficult in so small a number of specimens as that mounted, to feel any security that even more definitely intermediate forms might not occur.

My careful re-examination of these specimens shows, however, that this process B has a free margin on one side, and that the other side is adherent to the eversible membrane, leaving only the tip free all round. When one regards merely this free tip, then the specimens arrange themselves into *ilicis* and *æsculi* quite satisfactorily.

Figs. 3, 4, 5 and 6, represent examples of *ilicis* (from camera sketches), and 7, 8 and 9 of *æsculi*. The limit of attachment on the attached side is marked in each case.

It appears that in *ilicis* the free extremity is much shorter than in *æsculi*, the points usually more numerous. In *ilicis* the free portion close to the attachment is short and has several points, then further out on the free side is a shorter projection with one or more spines. In *æsculi* there may be, as in fig. 9, one long simple cusp (not unlike *acaciæ*). This cusp may have, as in 7 and 8, subsidiary spines, one or more, on the side facing the attachment, but has none on the outer side, unless we count such teeth as in figs. 4 and 8 occur at some distance down the shaft, and cannot be regarded as belonging to the free tip. Probably the long cusp of *æsculi* represents the outer group of spines that is so short in *ilicis*, while the group of longer, but still very short, spines forming the inner group in *ilicis*, are represented in *æsculi* by the few inner teeth that are so small, or even absent.

The very minute difference between these two species as regards the structures under consideration, compared with the wide distinction from *spini*, and still more from *pruni*, seems to afford proof that here, as in other characters, the species are most closely related. They also suggest this reflection, that two species believed to be distinct will, if they are so, show some differences in these appendages, minute though they may be, and though they may for long elude detection.

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#### EXPLANATION OF PLATE X., FIGS. 1 AND 2.

Fig. 1.—Ædeagus of *T. æsculi*, male.

Fig. 2.—Ædeagus of *T. ilicis*, male.

Only the ædeagus is figured as I find no difference in the other parts of the appendages, and the female appendages, being inconclusive, are also omitted.—J. L. R.

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## BUTTERFLIES OF THE CHILTERN: WITH A NOTE ON CERTAIN EXOTIC FORMS AT LARGE IN BRITAIN.

BY HUGH SCOTT, M.A., F.L.S., F.E.S.

(University Museum of Zoology, Cambridge.)

THE articles in this volume by Mr. Rowland-Brown and the Rev. J. W. Bussey Bell on the butterflies of the Buckinghamshire and Oxfordshire Chilterns have been of great interest to me, since during the past sixteen years I have become closely acquainted



with that part of the Chilterns in the vicinity of Henley-on-Thames. This town lies at the meeting-point of three counties. The Thames in its windings here flows for a few miles in a general northerly direction: the country on its eastern side (where also there is an extension of the chalk hills) lies in Berkshire; the town of Henley, on the western bank, lies in a corner of Oxfordshire; while about a mile to the north of it, on the same side of the river, is the boundary of Bucks. Thus the very numerous walks to the north and west of the place, leading into the heart of the Chilterns, may lie either in Oxfordshire or Buckinghamshire.

The country in this part of the Chilterns is of the same general type as that described by Mr. Rowland-Brown. The hills form an escarpment, the steep slope of which, facing roughly north-west, lies six to eight miles distant from Henley. At the summit of this steep scarp they are naturally at their highest. A point in Bucks. not far from Watlington Hill is 837 feet above sea-level; while in Oxfordshire, a few miles to the south-west, a point near Nettlebed reaches 607 feet. On the steep face of the escarpment, too, are a number of the open spaces such as Mr. Rowland-Brown has described, covered with the wild chalk-hill flora and dotted with dwarf junipers. But it is not of the steep scarp that I wish to write so much as of that part of the much more gentle slope—facing roughly south-east—within about five miles of Henley; that is, seven or eight miles south of Mr. Bussey Bell's district. This area consists of plateaux and rounded chalk hills rising to elevations of between 300 and 500 feet and intersected by ramifying valleys, almost all of which, excepting the main valley of the Thames, are devoid of streams. Well may Mr. Rowland-Brown write that the one feature lacking in the otherwise diversified landscape is water. The hill-tops in many directions bear an almost unbroken succession of beech woods. Their steep sides are given up partly to pasture, partly to arable land; while here and there are open, abrupt slopes where the chalk-hill flora is left to flourish at will. Such places are covered with a profusion of flowers—marjoram (*Origanum*) and thyme, restharrow (*Ononis*), *Helianthemum*, *Hypericum*, hawkweeds, scabious, salad-burnet (*Poterium sanguisorba*), with *Centiana* and *Chloris* in places, and many others; and are dotted with bushes of *Cornus*, *Viburnum*, &c. Add to this a number of gorse-covered commons on the hill-tops; plantations of larch and other conifers, mostly of recent date; occasional patches of hazel-copse; elms along many of the roadsides; and one has summarized the main features of a landscape as beautiful, in the writer's opinion, as any in England.

The subjoined notes represent the impression made by the butterfly fauna on an observer and entomologist who is *not* a special student or collector of butterflies. They are gleaned



largely from written general natural history notes kept during several years. Obviously they are very fragmentary, partly because my residence in the district has never been continuous over a whole season or year, but has consisted of shorter or longer stays at almost all seasons.

The butterflies have to some extent made an impression of relative scarcity, considering the nature of the country. Not that a complete list (which mine does not profess to be) would be by any means short, or uninteresting—for some of the species are not our commonest forms. But I can never recall meeting with butterflies in such profusion as I have sometimes seen in other parts of England. For instance, a walk across the South Downs near Worthing at the end of July, 1914, was enlivened by the presence of *Fritillaries*, *Lycænids*, *Pieris*, *Hipparchia semele*, &c., in numbers such as could hardly have failed to strike even a very casual observer. Such abundance as this I have never found in the district under review.

#### HESPERIIDÆ.

*H. malvæ*, *N. tages*, *A. sylvanus*, *A. flava* (= *thauumas*), all fairly common. I cannot recall ever having seen *A. comma*. Of written records, *H. malvæ* was seen June 6th, 1903, and in some numbers, June 26th, 1902. *N. tages*, in numbers, June 6th, 1903, while a single bad specimen was taken June 26th, 1902. *A. flava*, numbers of bright, fresh specimens were seen, July 25th, 1902; a female was taken August 8th, 1902; and a single female was captured some time in September, 1899.

#### LYCÆNIDÆ.

*C. argiolus* has appeared in greater or smaller numbers each spring, principally about gardens in the outskirts of Henley. Judging from my MS. notes, it was particularly plentiful in the spring of 1900: I recorded it that year as scarce from April 12th till about April 20th, afterwards common up till the time of my departure on May 1st; still common, May 26th–27th, reappearing in smaller numbers in July, and becoming gradually scarcer during August.\*

*A. corydon* appears to be absent from the vicinity of Henley. Both Mr. Rowland-Brown and Mr. Bussey Bell record it as abundant in places on the steep north-western slopes of the escarpment, but the former writer states that only a few stragglers come over to the south. The heavily-wooded nature of the hills, and the much smaller extent and less down-like character of the vegetation of the open chalky hillsides, may account for its scarcity on the southern side.

\* Frequently seen this year from the time of my arrival up to the time of correcting proofs, August 13th–26th.

*P. icarus* and *C. phlæas* are of course common. *Thecla rubi* is also fairly common in certain places.

#### PIERIDÆ.

Under this family I have very little to record. A single specimen of *Colias edusa* was seen in August, 1900: apart from this I do not remember seeing any *Colias*. *G. rhamni* is abundant; dates when first noticed in spring are: April 20th, 1901 (in numbers), April 13th, 1902, April 12th, 1905, April 16th, 1906. Nothing specially noted concerning *E. cardamines*, *Pieris brassicæ*, or *P. napi*. Dates when *P. rapæ* was first noticed in spring are:—April 22nd, 1901 (several), April 13th, 1902, April 16th, 1906.

#### NYMPHALIDÆ.

I have never seen any Fritillaries in this district. This may be due to my never having been at suitable places at the right time; but, considering the frequency of my visits in most seasons, my intimacy with the details of the country, and the abundance of flowers, it is hard to understand how the larger kinds, at any rate, could have been overlooked, and their absence has always seemed to me unaccountable.

*P. atalanta*.<sup>\*</sup>—This species is present, but I have never seen it in great profusion. (My only written record is of seeing a very perfect specimen on July 30th, 1900.)

*A. urticæ* is common, and specially noticeable in early spring.

*E. polychloros*.—One seen, April 22nd, 1901; one seen, April 13th, 1902; two captured between August 16th and August 24th, 1902.

*V. io*.—Fairly common. Dates when first noticed in spring:—April 15th, 1905, April 16th, 1906.

#### SATYRIDÆ.

*P. megæra*.—Mr. Rowland-Brown writes that this species has become very scarce in the central part of the Chilterns, and Mr. Bussey Bell calls it "quite scarce along the hills." My own experience tallies with these statements, for I have no record of its occurrence in my district. But as soon as one descends from the escarpment on to the lower lands and different soil to the north-west, this butterfly appears. Thus I saw it near Wallingford on August 20th, 1915, and Mr. Rowland-Brown tells me he found it common near Moulsoford in September, 1902.

*P. egeria* var. *egerides*.—Moderately common.

*M. galatæa*.—A considerable number of specimens were present on one of the flowery hillsides described above in July, 1899, and I have noticed others in the same place on subsequent occasions, but without recording the dates.

\* From August 13th till August 26th, 1915, I have not seen a single *P. atalanta* in the Henley district, but *V. io* is fairly abundant.

*E. tithonus*.—I do not remember seeing this near Henley. Lately (August 13th–26th) I have looked expressly for it among the hills and dry valleys without success. I saw it, however, in numbers near the bottom of the steep northern escarpment\* on August 20th, 1915, and Mr. Rowland-Brown tells me it is common in the *lower* dingles of the part of the Chilterns known to him.

*E. jurtina* and *C. pamphilus*.—Common.

I may add here the record of a remarkable find made last year. On September 21st, 1914, a female of the North American *Papilio philenor*, Linn., was brought to me. It had been taken in a cottage garden a mile from Henley; it was in excellent condition, and when found in the early morning appeared torpid with cold. The cottagers declared that they had seen it, or a butterfly like it, fly over their garden about three weeks before. No information was forthcoming as to who had let this insect loose or how far it had travelled, but it was not the only exotic *Papilio* seen in England last season. In the 'Field,' September 26th, 1914, p. 551, a correspondent wrote that he had seen (but not captured) on September 6th, in his garden at Warminster, Wilts, a large *Papilio* which he thought was almost certainly *P. asterius* (= *polyxenes*), also a North American form. Mr. J. H. Durrant also told me that an observer in yet another part of the country had seen a *Papilio* which he supposed to be an Oriental species.

## *CÆNOPACHYS HARTIGII*, RATZ. (BRACONIDÆ), A GENUS AND SPECIES NEW TO BRITAIN.

BY G. T. LYLE, F.E.S.

(PLATE X., FIG. 3.)

As recorded in the Ent. Mo. Mag. (vol. 51, p. 169) Dr. D. Sharp has recently obtained the beetle *Hypophlæus linearis*, F., in the New Forest, having discovered it in the burrows of the common *Tomicus bidens* in fallen branches of *Pinus sylvestris*. With these Coleoptera Dr. Sharp also bred several braconids, which he kindly passed on to me. I have been much interested to recognise in these a genus and species new to Britain, *Cænopachys hartigii*, Ratz., easily distinguished by the somewhat extraordinary thickening of the radial and cubital nervures of the upper wing in the male.

Ratzeburg mentions (Ichn. d. Forst. vol. 2, p. 33) that he

*Cf.* Mr. Bussey Bell's statement, "abundant . . . at foot of hills."



Fig. 1.



Fig. 2.

Photos E. M. Montgomery.

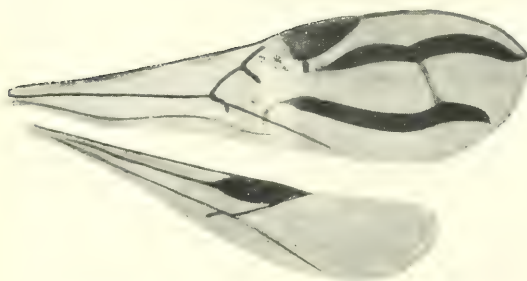


Fig. 3. --*Cornopachys hartigii* (Ratz.), male.





saw specimens of this insect which had been bred from *Harpella geoffroyella*, but Marshall (Species des Hym. vol. 1, p. 248) gives *Bostrychus* (*Tomicus*) *bidens* as the host.

A short description may not be out of place:—

Colour brown or blackish, orbits and clypeus rufotestaceous, mandibles rufotestaceous with the tips blackish. Legs testaceous. Frontal crests distinct, with curved, almost parallel, keels which give the ridges a crenulated appearance when viewed in profile. Antennæ blackish, male 19-jointed, female 21-jointed. Thorax punctate, metathorax more finely so. Abdomen rather longer than head and thorax, first segment striolate, more distinctly so in female, the rest smooth and shining. Terebra exerted, somewhat longer than two-thirds of the abdomen. Wings of male clouded with fuscous, the upper with a pale median transverse band, radial and cubital nervures very much thickened, the underwing with a large stigma near the middle of the anterior margin. Wings of female paler, radial and cubital nervures of upper wing not thickened, under wing without a stigma. Occasionally the second transverse cubital nervure is very indistinct in both sexes. Length, male  $1\frac{1}{2}$ – $2\frac{1}{2}$  mm., female 2– $2\frac{1}{2}$  mm.; expanse, male  $2\frac{3}{4}$ –4 mm., female 4–5 mm.

Altogether I have examined fourteen specimens, five males and nine females; the first appeared on April 15th and the last so recently as June 16th.

A careful search among the dead twigs, &c., from which the insects were bred has yielded two empty cocoons; these I found firmly fixed in the burrows of *T. bidens*; they are thin, white, with no gloss, and very similar in appearance to the cocoons of some of the smaller species of the genus *Apanteles*.

## NOTES ON TWO SOUTH AMERICAN PARASITIC HYMENOPTERA.

By A. A. GIRAULT.

### 1. *Eupelmus koebeli*, Ashmead.

The colorational description is correct but the scape is not mentioned. The pronotum bears a pair of black hair tufts, each somewhat longer and more slender than the one found on the scutellum of *Cheiloneurus* for instance. Scutellum coarsely scaly, also the triangular portion of the scutum. Elsewhere, very finely scaly. Venter transversely, mesopleurum longitudinally, finely lined. Central white portion of the ovipositor distinctly broader or longer than either black portion. Funicle 1 quadrate, 2–4 subequal, longest, each a little longer than the pedicel, nearly twice longer than wide; 6 quadrate. Scape reddish brown except above at apex. Scutellum not declivous; caudal scutum glabrous, suffused with brownish, no median ridge. Axillæ sculptured like the scutellum, barely separated.

Caudal margin at meson of segments 2-4 of abdomen slightly incised. Shape of abdomen approaching a little that of *Anastatus*. Type examined.

Three females reared from dipterous larvæ in the stem of *Anatherum bicornis*, British Guiana, H. W. B. Moore, 1914.

2. *Baeus auriceps*, n. sp.

*Female*.—Length, 0.75 mm.

Black, the head and tarsi dull honey yellow. Body finely reticulated, scaly, the pubescence very minute and scattered. Funicles 2-4 subequal, ring-like yet not annular, 1 larger, a little longer than wide. Pedicel nearly as long as the funicle. Differs from *niger*, Ashmead, in being larger, less pubescent, differently coloured, the second of the two transverse sclerites between the main thorax (scutum) and the abdomen longer (very transverse-linear in *niger*) and the frons is broader. From *piceus*, Ashmead, in the darker body coloration, the more distinctly scaly abdomen. From *americanus*, Howard, in the general coloration of the body and in the different colour of the male; otherwise this species (female) is very similar. From *minutus*, Ashmead, in general coloration and the sparser, shorter pubescence. Types of the named species compared.

The male is black, the legs (except coxæ) and the antennæ honey yellow, both lightly infuscated throughout; antennæ moniliform, the second or distal club joint as long as the pedicel, the other flagellar joints subglobular yet funicle 1 somewhat longer, the joints widest distad. Marginal cilia of the fore wing somewhat over a third of that wing's greatest width. Scape compressed. Head and thorax densely, finely scaly, the abdomen much less distinctly so. Segment 3 of abdomen (the first distinct basal segment, counting the rather obscure petioliform segment as 2) with short longitudinal carinæ at base, this segment occupying about a fifth of the surface, the next segment (4) extending to distal two-thirds. Propodeum with a semicircular carina across its face, the two horns disto-caudad, the apex of the arch not quite touching the base at meson.

Described from many females and two males reared from the egg-sac of a spider, Anna Regina, British Guiana, H. W. B. Moore, 1914.

*Types*.—Catalogue No. 19414, U. S. N. M., a pair on a slide plus one male, eight females on two tags (the latter paratypes).

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## SOME NOTES ON THE BUTTERFLIES OF THE COTSWOLDS (PAINSWICK DISTRICT).

By J. H. GRANT.

I RECENTLY had the pleasure of spending four days (from June 19th to June 23rd) in the delightful country surrounding

the picturesque old town of Painswick. The surrounding country is thickly wooded, the majority of trees being beech on the hill sides, with a fair sprinkling of oaks in the valleys. Making Painswick Beacon my centre I was within easy reach of Haresfield, Birdlip, and Sheepscombe, and these hills and the connecting valleys constitute, in my opinion, one of the best butterfly grounds in England.

Seated on one of the "banks" on June 21st, in the course of an hour, viz. from 12 noon until 1 p.m., I counted the following insects:—

*Lycena arion* (eleven), *L. icarus* (eight), *L. bellargus* (six), *L. astrarche* (very numerous), *Zizera minima* (very numerous), *Argynnis aglaia* (four), *Pyrameis cardui* (one), *Melanargia galatæa* (six), *Ctenonympha pamphilus* (very numerous), *Thecla rubi* (four, much worn), *Hesperia malvæ* (three), *Thanaos tages* (two), *Augiades sylvanus* (very numerous).

In addition to the above butterflies there were a good number of the day-flying moths. *Zygena trifolii* and *Z. filipendulæ* were very numerous and in fine condition, and *Acidalia ornata* fairly common.

During the four days I was in this district I netted about twenty *Lycena arion* in all, only seven of which were absolutely perfect, six being very much worn, and the remainder, although in fine condition and apparently only having recently emerged, were all useless on account of small triangular pieces being missing from the ends of the fore wings. I am rather at a loss to account for this, as the fringes of the wings were quite perfect. I have heard the opinion expressed that possibly this injury was caused by ants while the wings were expanding, and certainly I cannot think of any other explanation which quite fits the case, as when the wings are injured by briars the piece usually hangs loose. It was very interesting to contrast the habits of the various "Blues"; for instance, while *L. astrarche* and *L. bellargus* seem much attached to one place, and frequently return there even after being disturbed, the *L. arion* were never at rest, but seemed to be always on the wing, flitting from glade to glade something after the manner of the "Fritillaries"; in fact this was the surest method of distinguishing them from the females of *L. bellargus* and *L. icarus*, which rather resemble them when in flight. The *Zizera minima* are also very fond of congregating in one spot in small colonies, and strongly resent any other insects trespassing on their preserves; in fact I was very much amused to see one of these fearless little insects fiercely attack a magnificent *Argynnis aglaia* which came too near the particular plant on which it rested, the combat reminding me of a picture I had recently seen of an aeroplane attacking a zeppelin! I should like to mention one peculiar circumstance I noted in connection with *Lycena arion*, which is that during the



whole time I spent in the district I did not see a single specimen alight on wild thyme. I had several fine clumps of thyme under observation for a considerable time, and *L. arion* was constantly passing, but although I saw several rest upon the grass at the foot of the dwarf beeches and larches which grew all over the hill side, I saw none alight on their food-plant, and this tends to confirm observations made in previous years. I could have understood this better had the great majority of the insects been males, but of the twenty I netted twelve were females and eight males. *Pararge megera* were fairly common on the stone walls enclosing the fields, but were very much worn; but *P. ceteria* were in fine condition and very plentiful, flitting along the tree-lined lanes from sunlight to shadow in the manner familiar to all entomologists. I took several fine specimens of *Asthena blomeri* in the beech woods at dusk, and *Iodis lactearia* were very common among the undergrowth, and in good condition. I was rather surprised to come across a fine colony of *P. plantaginis*, both males and females being in good condition, the latter especially so, and in the same valley many *Euchelia jacobææ*, *Zygæna trifolii*, and *Z. filipendulæ*. *P. plantaginis* and *E. jacobææ* were very late for this district, although many of the insects I encountered seemed rather earlier than usual.

I saw several large colonies of larvæ of *Vanessa io* nearly full grown, and individual larvæ of *Pyrameis atalanta*. I also saw many imagines of *Vanessa urticæ*, mostly in pairs, and a few *Pyrameis cardui*, all in very good condition. *Melanargia galatæa* has now become very common on all the hill sides, and on the dates mentioned were in fine condition.

Earlier in the season I have taken the following butterflies in this district:—*Argynnis euphrosyne*, *Euchloë cardamines*, *Cyaniris argiolus*, *Nemeobius lucina*, *Polygonia c-album*, *Thecla w-album*, and later *Lycæna corydon*, *Argynnis paphia*, *A. adippe*, *Zephyrus quercus* and *Aphantopus hyperanthus*, and, in addition to these, the commoner butterflies, such as *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Epinephele ianira*, *E. tithonus*, *Cœnonympha pamphilus*, *Adopæa tiamas* and *Chrysophanus phloëus*, are always to be found in large numbers in their particular localities. I have never taken *Lycæna ægon* on the Cotswolds nor *Satyrus semele*, although I believe the former was taken some years ago on one of the hills. *Ino geryon* occurs in large numbers on several of the hills in early June.

Ward End, Birmingham.

# THREE NEW BRITISH CHALCIDOID HYMENOPTERA: WITH NOTES.

BY A. A. GIRAULT.

## 1. *Coccophagus brittanicus*, n. sp.

*Female*.—Length, 0.75 mm.

Valves of the ovipositor exerted a short distance. Black, the vertex, distal third and lateral margins of scutum, parapsides except a dot at mesal margin near (not at) cephalic end, and the scutellum bright golden yellow. Legs pale except caudal coxa and femur, caudal tibia just below the knee, distal tarsal joints and middle femora and tibiae at base (dusky scaly). Fore wings with a lightly infuscated band across from the whole of the marginal vein. Funicles 2 and 3 subequal, each nearly twice longer than wide, 1 distinctly shorter somewhat longer than wide, more or less subequal to the pedicel. Club joints subequal to each other and to funicle 3. Flagellum subfiliform. Longest marginal cilia of the fore wing about a third of the greatest width of those wings, somewhat shorter than the caudal fringes of the caudal wings, the latter with about five lines of discal cilia where broadest. Stigmal vein longer than wide, parallel with the cephalic margin, of about uniform width. Fore wings with uniform discal cilia. Mandibles tridentate. Marginal vein rather thick, a little shorter than the submarginal.

Described from three females on a slide with *Apterotrix longiclava*, Girault.

*Types*.—Catalogue No. 19632, U.S.N.M., the above specimens.

## 2. *Coccophagus niger*, Masi.

This species differs from *immaculatus*, Howard, mainly in having the coxae black; its sculpture I have not seen. The venter has much yellow. A female reared at Manchester from *Lepidosaphes ulmi* (A. D. Imms).

## 3. *Phycus testaceus*, Masi.

This species was reared with the preceding.

## 4. *Aphelinus mytilaspidis*, Le Baron.

What appears to be this species was also reared with the preceding.

## 5. *Aphidencyrus aspidioti*, Girault, *brittanicus*, n. var.

*Female*.—Almost exactly similar to *aspidioti*, Girault, but there is very slight staining along the marginal vein, and the frons is somewhat broader. The species runs close to *Encyrtus hyalinipennis*, Mayr, and may be that species, yet the caudal knees are not white (only the base of caudal femur), and the distal halves of the first two tibiae are not white because the middle tibia should be described rather as being somewhat broadly banded with black

proximal, since there is considerable white below the knee. Also the marginal vein is somewhat longer than the stigmal, the proximal four funicle joints are black (not yellowish-brown), and the pale portions of the legs and antennæ are white (not yellow). Also funicle 1 is a little wider than long, not quadrate, and 6 is about the same, yet much larger than 1. These are all minor differences, and the species was named with caution and yet from North American material.

The above variety is described from three females reared from *Lepidosaphes ulmi*, Manchester, Eng., A. D. Imms.

*Type*.—Catalogue No. 19633, U.S.N.M., two females on a slide.

*Apparent* males bore a very long solid club and the legs nearly entirely black; the antennæ about 5-jointed.

#### 6. *Apterotrix longiclava*, n. sp.

*Female*.—Length, 0.60 mm.

Black, the vertex, caudal margin of scutum, scutellum and parapsides yellow. Fore wings with a smoky cross-stripe from the marginal and stigmal veins. Legs pallid dusky (caudal legs black), the knees, tips of tibiæ, and the tarsi pallid yellow. Antennæ dusky, filiform, yet the long 3-jointed club is indicated; pedicel longer than any funicle joint; funicles 1 and 3 subequal, each a-half longer than wide, funicle 2 abruptly shortened, somewhat wider than long; club joints elongate, 3 conical and a little shorter, 1 and 2 each about twice the length of funicle 3, over thrice longer than wide. Longest marginal cilia of fore wings over half that wing's greatest width, slightly shorter than the longest cilia of the hind wing, the latter bearing three lines of discal cilia and infuscated proximad. Stigmal vein nearly parallel with the costal margin.

The male differs in having the antennæ stouter, the first and third funicle joints longer, not much shorter than the club joints, which are somewhat shorter; pedicel shorter, slightly longer than wide; funicle 2 much wider than long. Flagellum striate.

Described from a pair on a slide reared from *Lepidosaphes ulmi*, Manchester, Eng., A. D. Imms.

*Types*.—Catalogue No. 19634, U.S.N.M., the above specimens with the types of *Coccophagus britannicus*.

I doubt if the characteristic of this genus will hold.

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### NOTES AND OBSERVATIONS.

THE RESTING-HABIT OF *HIPPARCHIA SEMELE*.—Other than Mr. Arkle's entertaining account of an entomological visit paid in July, 1890 ('Entomologist,' xxiii. pp. 363-366), and occasional notes scattered through the pages of our magazines, I am not aware of any special literature dealing with the Lepidoptera of Merioneth. I am unable to determine, therefore, whether *Hipparchia semele*

is as widespread inland as it is plentiful on the sand dunes stretching from Aberdovey towards Towyn, on the Bay of Cardigan. Newman, who apparently was in touch with few Welsh localities when he wrote his 'British Butterflies,' remarks that he "never saw it settling on flowers or basking in the sun (*cp.* also Mr. W. Rait-Smith on "The Butterflies of Abertillery, Mon.," 'Ent. Record,' xviii. (1906), p. 309). With regard to flowers, my recent experience is quite the reverse. The little sequestered gullies and clefts of the sand hills, running seaward from the Aberdovey golf-links, in early August are gay with the beautiful Sea Holly, *Eryngium maritimum*, and its tufts of lavender-blue blossom are visited by both sexes in considerable numbers whenever the sun shines. I even observed on one occasion the butterfly paired upon the flower-head. In the matter of basking, *semele*, I think, contrives to combine the pleasure of a sun-bath with protective mimicry. As soon as it settles on the warm sand—usually where there is some moisture—it closes the wings immediately at right-angles to the body, and lies over on the side, just as I have seen several species of *Erebia*, notably *Erebia tyndarus*, in order to escape attention. Otherwise, the tastes of the Grayling are less æsthetic; at Aberdovey I frequently saw them upon cow droppings, as abroad, where also they affect fir-tree stems upon which, when at rest, they are effectually concealed. Other butterflies haunting the *Eryngium* were *Polygonmatus icarus*, with the blue females in the ascendant, and *Chrysophanus phlæas*; but "Blues" and "Coppers" alike were completely outnumbered by *Anthrocera* (*Zygæna*) *jilipendula*, the males of small size, whose pearly cocoons were hung everywhere on the marram bents. Mr. Arkle (*loc. cit.* p. 363) reports that the furze- and fern-clad slopes in the neighbourhood of the town "are said to be a locality for *Lycæna arion*." It would be interesting to know the authority for this statement; the terrain is likely enough with its ant-hills and abundant wild-thyme and marjoram. Has anyone followed up the clue at the right season of the year? It is on just such a formation as that of these hills that I have found continental *arion* most common.—H. ROWLAND-BROWN; Harrow Weald, August 8th, 1915.

PAPILIO MACHAON: A SUGGESTION.—I do not know whether there are any resident lepidopterists in Aberdovey. If so, I venture to make them a suggestion and an offer. On the slaty rocks above and in the town, and on the right bank of the river Dovey, the fennel—*Foeniculum vulgare*—attains to continental height and luxuriance; it is widely distributed and apparently emancipated from the garden. Looking up the pabulum of *Papilio machaon* given by the various British authorities I was rather surprised to find that neither Mr. L. W. Newman and Mr. H. A. Leeds, in their recent (1913) text-book, nor the late J. W. Tutt, in his 'British Butterflies,' mention this species of fennel as an alternative food plant; though Mr. South, in 'Butterflies of the British Isles,' cites it with *Angelica sylvestris*, *Daucus carota*, and *Peucedanum palustre*. Wherever the fennel grows in France on the cliffs fronting the Channel it is a conspicuous feature in the landscape, and usually



harbours at the right season the larvæ of *machaon*. With such favourable conditions of climate as Aberdovey enjoys, it should not be difficult, under like circumstances, to maintain our only Swallow-tail, and I may add that, thanks to the generous offer of a brother entomologist, I am able to provide the necessary foundation for a colony. I have never found the larvæ of *machaon* on any other plant; though this, of course, may be a mere accident, for M. l'Abbé Frionnet ('Les Prem. États des Chenilles Lépid. Français, 1906,' p. 45), has collated a considerable variety in addition, e. g. *Seseli* (possibly an error, as this is the known food plant of *P. alexanor*); *ferula* (also of *P. hospiton*); anise, *Pimpinella anisum*, and *P. saxifraga*; *Pastinacea* (*Peucedanum*) *sylvestris*, and *P. sativa*; parsley, *Petroselinum sativum*; rue, *Ruta graveolens*; dittany, *Dictamnus albus* (*teste*, Lambillion); *fragaria*; and loosestrife, *Lysimachia nemorum* (*teste*, Kirby); cabbage! (*teste*, Castin); and in Algeria, according to the Rev. A. E. Eaton (Ent. Mo. Mag. 1894, p. 162), *Deverra scoparia*, Cuss, & De C. The list is remarkable for the number of cultivated herbs and growths of the garden—one may doubt the cabbage—in which evidently *P. machaon* is as much at home in France as on the sea cliffs, alps, and pastures.—H. ROWLAND-BROWN; Harrow Weald, August 8th, 1915.

HIBERNATING EXAMPLES OF EUVANESSA ANTIOPA.—Mr. F. W. Frohawk's article in this month's 'Entomologist' (*antea*, p. 197) reminds me that many years ago I was going through a box of Lepidoptera taken by the late Mr. Tester, of Tilgate; seeing a large hibernated female specimen of *Euvanessa antiopa* I asked him where he got it and he told me "he captured it in the forest in the spring flying round a willow bush." I daresay some of the old collectors will remember seeing the specimen—a very dilapidated one—in Mr. Tester's box—but what eventually became of it I know not. In 1872, when *antiopa* was almost a common butterfly, three were brought me, one of which was taken hibernating in a dining-room on September 29th of that year. There can be no doubt that *antiopa* hibernates in this country and in my opinion breeds here also (why should it not?) only so few that we have not been able to find the larva—we do not properly search for it.—A. H. JONES; "Shrublands," Eltham, August 2nd, 1915.

HIBERNATION OF PERONEA SPONSANA, Fab.—With reference to Prof. Meldola's interesting note (*antea*, p. 198) I should like to record the capture by myself of an hibernated specimen of this species in March last at South Petherton, near Yeovil; although the specimen was rather in poor condition it was quite simple to identify it.—B. S. WILLIAMS; 77, Durham Road, E. Finchley, N., August 11th, 1915.

SYMMOCA QUADRIPUNCTA, Hw.—Although this rather striking little moth is not considered a rarity it can hardly be termed a common thing. I have been in the habit of finding it on the walls in the house here and also when living at Thornton Heath, but never more than two or three in any one season; until this summer, however, I did not know how to work for it successfully. On July

24th last I was passing a fence just as dusk was coming on and was surprised to find my little friend in some numbers. I boxed a dozen, most of them getting the worse for wear, and saw nearly as many more, all on this short piece of fencing. I looked again in the morning, but not one could I find! In the early evening I went again and found out the reason of my non-success. The fence is a "close" one, *i.e.* with the pales overlapping, and as dusk came on I watched three or four crawl out from between the overlapping pales, where doubtless they sat securely hidden during the daylight hours. In a few minutes I had taken several more. Other fences of a similar description also yielded a few. I am anxious to know something about the larva and its habits. Both Stainton's 'Manual' and Meyrick's 'Handbook' are silent. The only information I have is embodied in a very interesting article by Mr. Bankes (Entom. xix. 118-121) where (p. 120) he remarks, "*Ecogenia quadripuncta* (*kindermanniella*) amongst *Parietaria muralis*, in the dead stems of which plant the larvæ have been found feeding in April." From the facts of the moth frequenting houses, and the fences on which I found them being overhung by thick privet hedges filled with dead twigs and accumulated rubbish, I expect the larva is not too particular about its pabulum so long as it is dry enough!—A. THURNALL; Wanstead, August 10th, 1915.

TORTRICINA AND TINEINA IN ESSEX.—The following list includes a few species not hitherto reported from this part of Essex: *Alucita lienigiana* occurred freely as larvæ on June 8th at Thorpe Bay. When searching the ragwort for this plume two *Aristotelia hermannela* were disturbed. *Bactra furfurana* occurred in great plenty at Bowers Gifford on July 3rd, but were so worn that it was difficult out of a large number taken to get half a dozen specimens in a sufficiently good condition for the cabinet. *Aristotelia lucidella*, not previously seen in the district, was, at the same time and place, very common. Both flew freely in the late afternoon. Our public park provided, on July 11th, *Enarmonia oppressana* on the poplars and *Catoptria juliana* on the oaks, both of them in some numbers. I noticed *Argyresthia glaucinella*, new to me, on an oak trunk. A search for further examples of this species raised the total number to eight. *Scythris chenopodiella* was found on a fence at Westcliff on July 17th, and *Gelechia dodocella* on a fence, July 18th. When sweeping for *Sesia ichneumoniformis*, which was not at all rare, at Benfleet on July 30th I got *Elachista biatomella*, flying freely: occasional specimens of *Anacamptis tenuiolella*, and *A. anthyllidella*; also *Parasia metzneriella* and a few specimens of *Epiblema cæcimaculana*.—F. G. WHITTLE; 7 Marine Avenue, Southend-on-Sea.

THREE APPARENTLY UNRECORDED FOOD-PLANTS OF THE LARVA OF HYPOCRITA JACOBEE.—This year I found larvæ of the above-mentioned insect feeding on *Sisymbrium sophia* and on *Senecio crucifolius*. Some years ago when collecting in Pusztá Peszer, in Hungary, I found larvæ on *Podospermum jacquinianum*.—N. CHARLES ROTHSCHILD; Arundel House, Kensington Palace Gardens, W.

**COLIAS EDUSA IN THE NEW FOREST.**—On July 6th I saw a specimen of *Colias edusa* flying in the New Forest, but was unable to determine its sex.—(Rev.) J. E. TARBAT; Farcham, Hants, July 29th, 1915.

**SECOND BROOD OF ZIZERA MINIMA.**—During this month quite a number of *Zizera minima* have been taken on the Salisbury downs. As all the specimens are in good condition, and most of them have the appearance of being newly out, doubtless a second brood of this butterfly has occurred.—A. S. CORBET; August 16th, 1915.

**SPHINX CONVULVULI IN ISLE OF WIGHT.**—On August 12th I captured male and female *Sphinx convulvuli* at a patch of *Nicotiana affinis* in my garden. This is the earliest date that I have taken this species here.—G. NOBBS; North Lodge, East Cowes, Isle of Wight.

**SPHINX CONVULVULI IN LINCOLNSHIRE.**—A fine specimen of *Sphinx convulvuli* was taken early this morning sitting on a towel hanging out to dry in a back yard in this town. I have no previous record of it in this district.—G. W. MASON; Barton-on-Humber, August 21st, 1915.

**ZEPHYRUS BETULÆ IN EAST HANTS.**—It may be of interest to record the capture to-day (August 25th) of a male specimen of the Brown Hairstreak. I took it in an open space in a large wood about a mile from the village of Hawkley. I have never come across the species in this neighbourhood before, nor is it mentioned by Mr. Oldaker in his list of the lepidoptera occurring within six miles of Haslemere (Science paper No. 5 of the Haslemere Nat. Hist. Soc.), a radius which almost reaches this district. I searched carefully for further specimens, but failed to find any. The wood abounds with blackthorn.—SYDNEY WHICHER; Westmead, Liss, Hants, August 25th, 1915.

**COLEOPTERA OF SUFFOLK.**—Mr. Claude Morley has just issued a first Supplement to his 'Catalogue of the Coleoptera of Suffolk.' In 1899, when the Catalogue was published, the number of species for the county was given as 1763; in the Supplement this total is extended to 1982, but the additional species only are entered. It is satisfactory to note that upwards of 50 of the 183 species included in the 1899 Catalogue on more or less doubtful authority, are now unquestionably entitled to a place in the county list.

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## RECENT LITERATURE.

*The Genitalia of the Group Geometridæ of the Lepidoptera of the British Islands.* By F. N. PIERCE, F.E.S. Illustrated by the Author. Liverpool: F. N. Pierce. 1914. Pp. xxix-88, with xlviii. Plates.

With the assistance of the Rev. C. R. N. Burrows, F.E.S., Mr. Pierce pursues his researches in the Geometridæ with the same methodical care and accuracy as he bestowed upon his examination

of the ancillary appendages of the Noctuidæ. This new volume comes, therefore, as a welcome supplement to the literature of a branch of entomological science ever growing in favour and importance with scientific workers. Nor will the minute diagnosis of the organs of the Geometers appeal to the biologist alone. There are plenty of collectors who experience the same difficulties in separating the species of certain Geometrid genera, as exists with the Rhopalocera and Noctuids, difficulties which a more intimate knowledge of these structures should at once resolve. For example, in the genus *Oporinia*, where wing markings are apt to confuse the inexpert, Mr. Pierce points out that the use of a hand-lens when setting the males will materially help identification of species. He is also in a position to disperse not a few of the legends which have grown up round continental Heterocera, claimed for the British lists, and closely allied to our insular species. Mr. Meyrick twenty years ago expressed the opinion that the "British" *Abraxas punitaria*, L., were no more than exceptional aberrations of *A. sylvata*, Sc.\* Mr. Pierce shows that the appendages are entirely distinct in form; and the mistake should not be perpetuated. Students will derive considerable help from the appended Glossary of Terms, to say nothing of the exquisitely drawn figures of the respective organs, to which in each case is added the name of the species represented side by side with the design; for there are many who agree with the author and with Mr. Burrows that "drawings are preferable to photographs, as the latter, by showing too much, make it difficult to grasp the significant points." We congratulate Mr. Pierce heartily on this his latest monograph. It should be in the hands of every lepidopterist who employs microscope and hand-lens.

H. R.-B.

## OBITUARY.

### COLONEL NEVILLE MANDERS, A.M.S., F.Z.S., F.E.S.

Another name has been added to the imperishable Roll of Honour by the death of Colonel Neville Manders, Army Medical Service—a name well-known to the Fellows of the Entomological Society of London, among whom he counted a host of friends; for he was the most genial and lovable of men, an ardent naturalist, and, above all, devoted to the specialised branch of our science which has been called lepidopterology. Born at Marlborough in 1859, the youngest son of Major Thomas Manders, 6th Dragoon Guards (Carabineers), he was educated at Marlborough College, where he early evinced an interest in the local Lepidoptera, as shown in the very last published number of this magazine (*antea*, p. 196); and he has often discussed with the writer of this notice past captures and future possibilities of the neighbouring forest of Savernake. On leaving school he qualified as F.R.C.P. and M.R.C.S., and entered the Army Medical Service in 1881. The following year he took part in the Suakin Campaign (medal with clasp and Khedive's Star). From 1887 to 1889 he was with the British forces operating in Burmah, where he was badly



wounded (medal and two clasps). After further service at home and in the East, he was appointed Deputy-Director of the Medical Service in Egypt, remaining at Cairo until last January, when, by special request of the War Office, he was appointed to the Headquarters Staff of the Australian and New Zealand Forces. With them he proceeded to the Dardanelles, finding time even among the battle-smoke and din of action to observe the butterflies and other living creatures pursuing their lives undisturbed in and about the trenches. Indeed, I believe his last published words to have been a description of Nature calm amidst the turmoil of war. "Wonder of wonders, there is a nightingale in full song, oblivious of the making of history, and only impressing upon a casual listener that after all it is love that rules the world."

A keen critic of the various theories of mimicry, he contributed to the discussions and Transactions of the Entomological Society, of which he was elected a Fellow in 1887; while his service in Ceylon and the Mauritius was productive of several remarkable works, over and beyond occasional notes in this and other periodicals.\*

Colonel Manders was also deeply interested in the butterflies of the palaearctic region, notably of the Mediterranean French Riviera; and latterly of Egypt, where, in conjunction with Mr. P. P. Graves, he made himself thoroughly acquainted with the Lepidoptera of the Delta.

My last meeting with him was at a meeting of the Entomological Society, when he had been transferred from the Curragh to Cairo and was home on leave. His time of service was then, to all appearances, drawing to its natural close: and we discussed the pleasures of retirement to some butterfly-haunted neighbourhood where it would be possible to ride our particular hobbies at ease. He leaves behind him a widow, the daughter of Mr. F. N. Vane, of Ceylon, and one daughter. Well has she written his epitaph:—

"Il est mort sur le Champ d'Honneur."

Mrs. Manders received the following telegram from the G. O. C., the New Zealand and Australian Division: "On behalf of both myself and the whole of the New Zealand and Australian Division, I send our sincerest condolences. Your husband's work here and devotion to duly make his loss irreparable both to me and to the Division."

Truly, he was a very gallant gentleman.

H. R.-B.

\* *E.g.* "Some Breeding Experiments on *Catopsilia pyranthe*, and Notes on the Migration of Butterflies in Ceylon," 'Trans. Ent. Soc. London,' 1904.

"The Butterflies of Mauritius and Bourbon," *id.* 1907, with a coloured plate and figures of the male and female of *Nacaduba mandersi*, Druce, discovered by, and named after, the author of the paper; and another new sub-species named and described by himself—*Antanartia mauritiana*, Manders.

"A factor in the production of mutual resemblance in allied species of Butterflies; a presumed Müllerian combination of *Euphas* in South India and *Amauris* in South Africa"; *id.* 1911.

"The Study of Mimicry (Batesian and Müllerian) by temperature experiments on two Tropical Butterflies"; *id.* 1912.

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A NEW ABERRATION OF *EUXOA CORTICEA*, HB.

BY GEOFFREY MEADE-WALDO, M.A., F.E.S.



I took the above aberration in my light-trap at Hever on July 5th last. The specimen is a male in good condition, and falls into Tutt's section A ('British Noctuae and their Varieties', ii. p. 61); it differs from the four varieties here listed, however, in having the claviform and orbicular stigmata almost obsolete.

It may be convenient for purposes of reference to name this aberration *obsoleta*. The specimen is deposited in the British Museum.

## SOME NOTES ON THE PAPILIONIDS.

BY CECIL FLOERSHEIM, F.E.S.

In spite of the fact that the late Mr. Tutt warned me that an early success of mine in crossing *Papilio machaon*, male, with *P. polyxenes (asterias)*, female, was not likely to be repeated, I have mainly spent the last few years, as far as entomology is concerned, in a fruitless endeavour to obtain further hybrids amongst the Papilioninae. In the course of my experiments, it

has been my habit to turn the surplus population of my butterfly-house loose on the countryside, and I gather from letters which I have received and from notices which have appeared from time to time in the 'Field' and other newspapers, that some of the insects which I have set at large have been observed or captured by students of nature in this country.\* In view, however, of the large number of specimens which I have released, amounting in the case of *Laertias philenor*, a North American pharmacophagous *Papilio*, to several hundreds each season, I have been surprised rather by the want of notice occasioned than by the reverse. It has struck me as remarkable that insects so conspicuous as *Papilio bianor* and *Laertias philenor* can be flying in considerable numbers for weeks at a time in this neighbourhood without attracting more attention. Perhaps some of the native butterflies which are believed to be extremely rare are not really so uncommon as we imagine, the more so as they are far from being as striking to the untrained eye as the species I mention.

It has been suggested that some of the exotic species of Papilionidæ which I have liberated might succeed in establishing themselves permanently in this country. This I believe to be unlikely on account of the fixed habit of double-broodedness of some, and the limited distribution of the food-plants of the others. And since my experiments, though fruitless in their main object, have given me a certain intimacy with the life-habits of the species concerned, I append some notes on the subject, laying stress on the points at which my own observations of the last few years supplement, or are at variance with, the information given in the usual text-books, including the life-histories which I worked out for the late Mr. Tutt, to which he refers in his 'Natural History of the British Butterflies,' vol. iii. part xviii., and the notes which at various times I supplied to the 'Entomologists' Record' when it was under his editorship.

The species which I have bred, or attempted to breed, in the semi-captivity of my butterfly-house, are the Nearctic Papilionids: *Laertias philenor*, *Heraclides cresphontes*, *Euphacides troilus*, *Jasonides glaucus*, *Papilio polyxenes (asterias)*, *P. zolicaon*, *Iphiclides ajax (turnus)*; and the Palearctic: *Papilio alcinous*, *P. bianor*, *P. xuthus*, *P. hippocrates*, and *Iphiclides podalirius*. I will now deal with these *seriatim*:—

(1) *Laertias philenor*.—This beautiful and interesting butterfly, a near relative of the so-called Ornithoptera, is an inhabitant of the greater part of the United States. In spite of the fact that it is a southern species which has spread northwards, and that its congeners, with the exception of one species in Mexico, are denizens of the forests of tropical America, it exhibits great climatic adaptability. In the southern portion of the United States it is said to produce several broods in the year, and in

\* Cp. Mr. Hugh Scott, *antea*, p. 212.

the northern portions of its habitat to be double-brooded. Here, on the whole, it may be said to be single-brooded, about eighty per cent. of the first brood going over the winter as pupæ after ordinary summers. Even after the exceptionally hot summer of 1911 about half my pupæ did not disclose imagines till the following year, and this in a season in which, with me for the first time, even *machaon* became almost entirely double-brooded. In common with several others of the Papilionids which I have had under observation, this species in the larval state shows great diversity in the time taken for feeding-up by different individuals, and half-grown "laggards" may be found, when "forwards" from batches of ova laid at the same time are already pupating. I think that in summers so variable as ours, this should prove a not unfavourable factor as far as the survival of this butterfly is concerned, since it is subject to the attacks of few enemies. As far as I have been able to observe during the last ten years, it is immune from parasites. The minute black ichneumon which infests my butterfly-house, and "stings" the newly-formed pupæ of all my other Papilionids, *alcinous* excepted, leaves *philenor* severely alone, and I have never bred *Trogon exesorius*, the pest of the Nearctic Papilionids, from any of the pupæ received at different times from America. It is free from the ravages of nocturnal foes of an insect kind. Neither earwigs nor Carabid beetles which prey on the young larvæ and newly formed pupæ of other species, even *alcinous*, appear to attack it, though I have seen the half-grown larvæ bitten and killed by a small green spider which abounds on my *Aristolochia*. Birds, too, show a pronounced distaste for it. The wild larvæ appear to live unmolested on the large plants of *Aristolochia* in my kitchen garden, and the pupæ have survived, though fully exposed throughout the winter, on bushes and the outer wall of a hothouse in the neighbourhood of my butterfly-house. Once when a box containing pupæ of this species and *P. polygenes* was left open by accident in my uncovered butterfly-house during the winter, all the *polygenes* were taken and the *philenor* left untouched. In this case I think that the culprits must have been birds, because the box in question was suspended by a string from the roof of the house, and was out of reach of other possible enemies. Mice, however, will eat the pupæ, though they prefer other kinds. In short, I think that this species would stand an excellent chance of establishing itself in the southern portions of this country were it not for the extremely limited distribution of the food-plant, *Aristolochia*, to which it is confined. In North America it is said to feed upon *Aristolochia siphon* and *A. tomentosa*, but of these *A. siphon* (Dutchman's pipe) is the only one which I have growing here. Unfortunately it does not seem to take readily to *Aristolochia clematitis*, our only native, or rather naturalized, species, which is found wild in



some parts of southern England. I have never known it to oviposit on plants of this species in my butterfly-house, always choosing *A. sipho*, and the larvæ will only feed upon it when hard up for food.

I have treated this species at greater length than I intend to do in the case of others, because of all the exotic Papilioninæ with which I am acquainted, it appears to have the best chance of surviving in this country, providing, of course, that its food-plant were grown in greater abundance. I may add, though it is outside the scope of this article, that in 1911 the first of the second-brood specimens were abnormally large, and creaked their wings, when handled, after the manner of the Vanessids, a phenomenon which I have never before remarked in this species or any other of the Papilionids I have bred.

(2) *Heracles cresphontes*.—With this butterfly I have been wholly unsuccessful. I have had no difficulty in obtaining pairings of it in my butterfly-house. But I have never seen it oviposit, nor have I ever discovered any of its ova or larvæ. It is a native of the Southern United States, but appears to have been spreading northwards of late years, and has been met with in Canada. It is highly distasteful to birds and rests with its wings fully expanded, not closed as did the other Papilionids I have observed, I suppose in order to display its warning colours.

(3) *Euphacides troilus*.—This species is a native of the Northern and Central United States. It has bred freely with me both out-of-doors and in my butterfly-house. In the text-books it is said to feed on lilac and magnolia, in addition to its ordinary food-plants, *Sassafras* and *Benzoni*, but though I have an abundance both of magnolia and lilac in my garden, I have never found the larvæ on anything but *Lindera benzoni* (Spice-bush)—I have no *Sassafras*. The ovum is white in colour and is laid usually on the under side of the leaf, only occasionally on the upper side. During the greater part of its existence the larva conceals itself by drawing together throughout their length the edges of a leaf of its food-plant by means of a silken carpet which it spins. Even when it is too small to do this, soon after emergence from the ovum, it bites out a transverse section of leaf and, using the same means, folds over a small portion, making a flap inside which it lives. It only leaves these tents in order to feed, returning when its meal is ended. When about to pupate, the larva, which when full grown is a bright apple green in colour, turns a clear orange brown, exactly resembling in tone a newly withered leaf of *Lindera benzoni*. It generally pupates on the lower twigs of the food-plant itself. A large proportion of the pupæ which I have received from America contained the ichneumon *Trogus exesorius*. This species, though usually single brooded with me, became entirely double brooded

in 1911. The rarity of its food-plants, *Lindera benzoni* and *Sassafras officinale*, should prevent it from ever establishing itself in this country, though in other respects it may not be unsuited. A peculiarity which I have noticed in this butterfly is that the imagines do not oviposit, or even as far as I have been able to observe, pair, for at least a week after emergence.

(4) *Jasoniades glaucus*.—This butterfly, the common tiger swallow-tail of the Eastern United States, in spite of its being a northern butterfly which has spread southwards rather than the reverse, shows far less climatic adaptability than *Laertias philenor*. Unlike that species and *Euphocades troilus*, it shows with me a noted tendency to remain double-brooded, and individuals which I have collected as full-fed larvæ and allowed to pupate in the cool temperature of a fruit-house, have still completed their transformations in the same season, emerging as imagines until late in October. This species does not oviposit freely in my butterfly-house, though I have found the larvæ out-of-doors on *Ptelea trifoliata* (American hop-tree). In the text-books it is said to feed on various Rosaceæ, &c., and indeed for a Papilionid larva, to be polyphagous. But though at the time I first bred it, plum, cherry, and birch, said to be amongst its food-plants, were grown in my butterfly-house, it always chose to lay its eggs on *Ptelea* (natural order Rutaceæ). I have found the young larvæ even on *Aristolochia siphon*. I may mention that on several occasions I have seen *machaon* pursue and attempt to pair with *glaucus* in my butterfly-house, and once I found a pair in copulâ. The ova were infertile as might be expected in the case of species so widely different. I may add that on this and the other occasions I mention, it was always the normal yellow female *glaucus* by which *machaon* was attracted, never the black variety. I have also seen *machaon* attracted by the female *Heraclides cressphontes*, and *Laertias philenor* (male) pursue the (female) *Euphocades troilus*. In all these cases the colours, and, to some extent, the general markings of the two species are similar. The habits of the larva of this species bear some resemblance to those of *Euphocades troilus*, in so far as it rests on a silken carpet which it spins over the middle of the upper side of a leaf. In its case, however, the edges of the leaf are only partially bent over, probably to prevent the larva from being washed away during heavy rains, not made to close completely over its back as in that of *E. troilus*. After the winter the pupæ of the spring brood of *glaucus* have a tendency to die unless supplied with an abundance of water, which would kill most other species.

(To be continued.)

A NOTE ON COLLECTING IN THE HIMALAYAS;  
WHERE THE EAST AND WEST MEET.

By J. C. MOULTON, B.Sc., F.E.S.

OUR favourite study, entomology, is fortunately above most of the restrictions imposed upon mere man. Thus Kipling's immortal decree that "East is East and West is West, but never the twain shall meet," has no force in the realms of entomology. The East and West *do* meet, and, what is more, fly together side by side in the Himalayas!

Like many others in these troublous times, the writer has laid aside the forceps and net for the sword—only for a short while, let us hope—so it is with more than usual enthusiasm that Sunday is welcomed as a respite from an uncongenial occupation. Off with the cares of khaki and let us away to some wooded dell, where insect life abounds, where the mind can turn to higher thoughts.

A further word of personal explanation is perhaps necessary. The Indian hot weather began towards the end of April, and our half battalion left the sweltering plains of Delhi for the more habitable hill-station of Kailana. This stands on a narrow ridge some 7000 ft. above the sea-level, a little west of the centre of the Himalayan range; lat. roughly  $31^{\circ}$  E. and long.  $78^{\circ}$  N. On a continuation of this ridge northwards is Chakrata, where more Territorials are stationed for the hot weather. Some fifty miles north-west is the well-known hill-station of Simla, the present seat of Government; thirty odd miles to the south-east is the less fashionable station of Mussoorie, well-known to students of Indian butterflies as the *provenance* of several important collections. To the north-east of the Kailana, Chakrata ridge, some sixty miles away, the wonderful chain of snow-clad mountains rises in majestic grandeur to 25,000 ft., a magnificent sight on clear days. To the south-west one has a glimpse of the jagged Siwalik Hills, bordering the Himalayas, and beyond them stretches an interminable expanse of heat—the plains of India.

Two hours' walk from Kailana brings one to the bottom of a valley rather less than 5000 ft. above the sea-level; two hours in another direction leads to Deoban, alt. 9300 ft. Try the first walk and the Eastern collector is busy with *Acræas*, *Danaines*, *Euploæas*, *Papilios*, *Kallimas*, and other familiar friends. Try the second walk and the entomologist might fancy himself in England chasing *Colias*, *Vanessa cardui*, *Fritillaries*, "Whites," our old friend the "Sulphur," not to mention "Small Coppers" and familiar *Satyrines*. Being used to Oriental butterflies, the lower walk appealed to me first, but it was not until I had collected on the higher altitudes that the contrast, and more



especially the proximity of the contrasting species, was really brought home to me.

The following notes are intended to illustrate the two series of home reminders that I experienced in this strange land, the one series reminding me of happy years among the butterflies of Borneo, the other of earlier days after English species; both reminders of East and West, be it noted, occurring within four hours' walk or in many cases actually together in this Himalayan station.

Leaving Kailana neck at 7 30 one Sunday morning towards the end of May, we followed the road along under the shady side of the hill. Deodars, chestnuts, and an occasional big rhododendron tree formed a pleasant border to the lower side, over which we could look a thousand feet or more below. Insects of any sort were scarce at this time in the morning; the only species noticed in the first quarter of an hour's walk along the road were the two Pierines, *Aporia soracta*, three individuals, and the blacker-veined *Aporia agathon* (*phryxæ*\*), and a little white moth.

As the sun rose the butterfly world soon came more into evidence; after 8 o'clock I could count ten to twelve *A. soracta* in sight together; some chestnuts in bloom seemed particularly attractive to them. In Kailana one or two trees literally swarmed with them, and near Mussoorie, thirty miles to the south-east at about the same altitude, I saw hundreds along a short stretch of the path, but that was a fortnight before.

Two large *Lycenopsis* species appeared as the first representatives of the "Blue" family (probably *L. vardhana*), followed shortly after by a small swift-flying *Argynnis*, which devoted its energies to the marguerite daisies on the roadside.

The little white moths appeared in greater profusion. I think this species must feed on oak, as I had noticed a large number fly out from these trees a few days before.

About this time I noticed some half-dozen Pierine "casualties" in the road; two of the dark *Aporia agathon* and two of the lighter *A. soracta* were lying dead in the road, and three more of the latter species were fluttering near by in a very feeble manner. Two were very much the worse for wear, but the others appeared to be uninjured, and I imagine their downfall was caused by a very heavy hail-storm the night before; if the hail-stones had not beaten them down, I suspect they had succumbed to the unusual cold.

A large brown Pentatomid sitting under the lee of a wall caught my eye and paid the penalty. Near him were two small Chrysomelid beetles on a black paling; they were also annexed.

\* Subspecific names are placed in brackets, thus, after the specific name throughout this paper.



At 8.30 the road through the straggling township of Kailana-Chakrata came to an end at a place called Morrow's Neck. From this point the ascent continued by a good bridle-path, first along a thickly-wooded slope, then for the best part of a thousand feet over an open rocky moor-like slope, very steep in some parts, but more amenable to butterfly collecting in others.

Before coming to this, a "Small Copper," *Chrysophanus phileas*, had been added to the list, as well as one of the Satyrines, *S. schakra*, which flattens itself out against the cliffs like our allied species in England.

Once out into the heat of the open hillside, a host of butterflies engaged my attention for the best part of two hours. Fritillaries were abundant; I think there was one other species besides the common Queen of Spain, *Argynnis lathonia (issæa)*, which, however, was the only one I caught. *Vanessa cardui* is "distributed over the whole world," Bingham states, and sure enough we found him on the slopes of Deoban in some quantity and variety. I think I saw the very similar *V. indica* once; certainly both occur together at Kailana. "Tortoiseshells" (*V. cashmirensis* or *V. rizana*) added to the home-like appearance of the fauna, as did an occasional *Gonepteryx rhamni*, which, by the way, ranges throughout the Himalayas under the above familiar name, unadorned by subspecific distinction. *Aporia soracta* still followed us into this open country, but in much diminished numbers. In its place another familiar Pierine helped to enliven the scene; this was the orange-coloured *Colias eogene*, Feld., very like our *C. edusa*.

Two swift-flying Hesperids were noted in the shady wood, and on the open slope we were able to catch a little *Syrichtus*-like species, *Hesperia galba*, Fab., flying close to the ground. Near it a species of *Macroglossa*, rather smaller than our *M. stellatarum*, was caught.

Visions of an exclusively English fauna were dispelled by a swift-flying Satyrine, in flight rather like *Limenitis sibylla* of England or *Papilio polytes* of the tropics. He first appeared at about 8000 ft, and then became quite common at 9000 ft. He was an aggressive butterfly, bigger than everything else on the wing, and apparently anxious to emphasize the fact by chasing now a Pierine, now a *Vanessa*, or perhaps, with more idea of right and wrong, one of his own kind. Bingham gives the range of this genus, *Aulocera*, Butl., as the Himalayas, Tibet, and Western China. Four rather similar species apparently occur together in the Himalayas; those I caught are referable to *A. padma*, Koll. Near the summit, 9300 ft., a large butterfly flew over, which I think must have been the leaf-like *Kallima inachus*. Several were seen 4000 ft. below this two days before, and I had seen two near Mussoorie at about 7000 ft., so perhaps this record from 9000 ft. is not impossible. In Borneo, *Kallima*

is rare, and usually found at low elevations. When alighting temporarily *Kallima* does not seem to be particular whether it selects the trunk of a tree, a branch, or the upper surface of a leaf. They are very worn here now, and I am informed that these are hibernated specimens.

Along the edge of a glade (just below the summit), carpeted with buttercups, wild strawberry plants and anemones, fritillaries flew up and down much as in the New Forest; one big species, *Argynnis childreni*, conspicuous by the blue suffusion on the terminal portion of its hind-wing, evaded capture, as did the blue *Vanessa canace*, of which I saw two. It was a joy seeing this old friend again, whose brother subspecies I had taken in some quantity at 3000 ft. on Mt. Kinabalu in British North Borneo.

*Pieris brassicae* and *P. rapae* were seen, but only a few. Another English-reminder was taken in the person of an *Erebia*, very like our *blandina*. And like a typical day's collecting in England, not a single *Papilio* was seen the whole day, although in a gorge 3000 ft. below our path I found several lovely species: the beautiful green *Papilio polyctor* (which is replaced further east by the well-known *P. paris*), the big black *P. protenor*, a mountain species ranging through the Himalayas (from Kailana, which appears to be its westernmost limit) east to China and Siam, then another Oriental friend, *P. sarpedon*, described by Linnæus a hundred and fifty years ago. These Himalayan specimens did not appear to differ at all from those of *sarpedon* caught in Borneo. This typical form ranges from North India and the Philippines, south to the Malay Archipelago, with subspecies extending its range as far as Japan in the north and the Solomon Islands in the south. Another beautiful *Papilio* caught at this lower altitude was *P. cloanthus*, which ranges through these mountains from Kashmere to Burma.

The absence of all these *Papilios* emphasized the British aspect of this day's collecting on the higher slopes above Kailana. A few days later *P. machaon* (*sphyrus*) was caught, reminding us that the Himalayas could produce a British *Papilio* if necessary.

The summit of Deoban was reached before mid-day, and after lunching in the open under some shady trees, in full view of the wonderful snows, we spent some hours collecting in the little glade below the summit and along some sunny paths near by. After four o'clock butterfly life became scarcer, and on our return journey down to Morrow's Neck, hardly a butterfly was seen. About 7 p.m. we reached Kailana; the sun had gone down; the vultures had finished their day's work—so sublime in the grandeur of their soaring, so repulsive in their unceasing search; now we saw them sitting in the tops of the trees below the ridge, looking like so many untidy fowls at roost. The shrill chorus of *Cicadas* somehow added to, rather than disturbed, the peacefulness of the gathering night.

But for these few foreign touches our day had been a pleasant reminder of collecting in England. A few days later in another walk from Morrow's Neck to a sheltered glade in a ravine some 3000 ft. below the summit of Deoban, the English dream was dispelled, and once more we could revel in all the glory of Oriental Rhopalocera. By way of a change I had brought a dozen men out armed with nets instead of rifles, and after they had been collecting for a quarter of an hour near the head of this ravine I wandered off by myself a little lower down. Soon a perfect stream of butterflies came down through the rather sparse undergrowth, and for the best part of an hour I watched them pass me. The energetic collectors above me evidently acted as beaters and drove all the butterflies of the place down the ravine and past me. None seemed to go back. The species most in evidence was the fine big Pierine *Delias belladonna*, in perfect condition. All the Papilios mentioned before were taken, also the big *sibylla*-like Satyrine *Autocera padma*, the leaf-butterfly *Kallima inachus*, the delicately traced white Nymphaline *Cyrestis thyodamas*, a strong flyer quite new to me, black, marked with orange brown, which turns out to be *Sephis dichroa*, an essentially Himalayan species ranging from Kashmere to Kumaon. Then an occasional *Acræa*, *Pareba vesta*, which had wandered in from its more natural haunt, the open hill-side, was taken. Lycænids were in abundance, bunched together on tasty patches of mud. A few monkeys crawling about on the steep sides of the ravine, a great eagle or vulture occasionally soaring over far above us, all added to the Oriental nature of the scene, and yet 3000 ft. immediately above us, as I have described already, the entomological atmosphere was typically British.

Since those two days' collecting at the end of May, several entomological incidents have occurred to illustrate this meeting of the East and West. One night the silver-striped hawk-moth, *Hippotion celerio*, blundered into the room, just as he ought to in England when one wants to finish a day's collecting with a good capture. Another night the eastern element paid a visit in the person of a noisy Cicada, *Platylomia saturata*, and one afternoon I found one of those enormous mosquitoes in the house, a species of the curious genus *Toxorhynchites*, very like two species of this genus which we get in Borneo.

In July the rains began; on some of the finer days between the storms, great swarms of locusts visited us. By timing them over a small stretch of ground I calculated their rate of travelling as about nine miles an hour. To one who had never seen them before they presented a wonderful spectacle. The whole valley below us was literally brown with them and the air thick with them, just as if they were large brown flakes of snow moving before the wind. They did a lot of damage to the



vegetable gardens, but apparently did none to the trees on which they rested in milligas. The crows enjoyed a feed of them, but other birds did not appear to come out after them; probably they stayed quiet in the bushes catching all they wanted there. The species was *Acridium peregrinum*, in its pink and brown migratory coloration.

The lovely green dragonfly *Neurobasis chinensis* (possibly a distinct local race here) reminded me of many a tropical scene in the interior of Borneo. The common Pierines, *brassicæ*, *rapæ* and *G. rhamni* rudely jerk one into duller memories of Palæarctica. Then a large Tabanid fly, probably *Pangonia longirostris*, thrusts a three-inch proboscis into a flower before me, as much as to say, "What about me? Do I remind you of East or West?" No, *Pangonia*, you are new to me, and will therefore serve as a good reminder of these wonderful Himalayas.

A comparison of East and West in the entomological world, as represented by the insects of this small portion of the Himalayas, could provide material for a very lengthy paper; but I have written enough to record my own pleasant surprise at meeting old friends of East and West, and I hope these notes may be sufficient to rouse the interest or pleasant memories of other entomologists who have had similar experiences.

A country which offers the possibility of captures *παρά προσδοκίαν* is more than usually attractive to the entomologist.

Kailana, United Provinces, N. India, August 18th, 1915.

## NEW SPECIES OF NOCTUIDÆ FROM FORMOSA.

BY A. E. WILEMAN, F.E.S.

(Concluded from p. 196.)

### *Chusaris* (?) *angulata*, sp. n.

♀. Head white, thorax ochreous white flecked with brown. Fore wings ochreous white finely flecked with darker brown; ante-medial line black, nearly straight, interrupted; postmedial line black, deeply angled beyond end of cell, interrupted; discoidal spot black, almost round; terminal lunules black. Hind wings rather white, traces of a dusky discoidal dot. Under side whitish brown flecked with dark brown and blackish; all wings have a dusky discoidal mark and a black transverse line beyond; the line on fore wings angled and only distinct towards the costa; the line on hind wings wavy.

Expanse, 17 millim.

Collection number, 1391 A.

A female specimen from Kanshirei, April 30th, 1908. Three specimens from Kanshirei (Wileman) in the British Museum.



*Hyphenagonia bipuncta*, sp. n.

Fore wings pale brown finely sprinkled with darker brown, costa dotted with darker brown; a black dot on the cell and two black spots at outer end of the cell; postmedial line dark brown, outwardly edged with whitish, inwardly shaded with purplish brown, band round cell thence inwardly oblique to dorsum; subterminal line dusky, diffuse, outwardly shaded with purplish brown; terminal dots black, connected towards apex; fringes pale brown mixed with grey-brown. Hind wings pale brown sprinkled and mottled with darker, whitish towards base; two black discoidal spots placed on a purplish brown band which is outwardly edged with black followed by a whitish diffuse line; postmedial line dark brown, diffuse, preceded by a dark brown medial shade; terminal dots black, connected towards apex, fringes pale brown. Under side pale brown, suffused with darker on the fore wings; all the wings have a black discoidal mark; there is a black dot in cell of fore wings and traces of dark transverse bands on the hind wings.

Expanse, 14 millim.

The type, from Formosa (Wileman), is in the British Museum.

*Hyphenagonia angulata*, sp. n.

Head and collar whitish brown, thorax darker brown; abdomen brown, paler at the base. Fore wings rather pointed at apex; termen bluntly angled at vein 3, whitish, suffused with pale brown and finely sprinkled with blackish scales; costa dotted with black towards apex; subbasal line indicated by a black dot on the costa and one below it; antemedial line black, interrupted, angled at costa, turned in at dorsum; discoidal mark black; postmedial line black, outwardly edged with whitish, excurved from costa to vein 3 thence inwardly oblique to dorsum; subterminal line formed of black dots edged with whitish, preceded by an almost parallel whitish line with two black dots on it about middle and one nearer the costa; terminal line black, not distinct between angle and termen; fringes whitish, brownish at tips and marked with dark brown at angle and apex. Hind wings slightly angled at vein 3; whitish with two brown transverse bands and a medial brown shade; discoidal mark black, followed by an almost straight black line, the latter forming the outer limit of the inner brown band; black scale on the outer brown band; subterminal line formed of linear black dots, area beyond pale brown, fringes slightly paler. Under side whitish clouded with brown on fore wings, markings somewhat as above but with some short black bars between the veins on terminal area of fore wings.

Expanse, 18 millim.

Collection number, 1298.

Two female specimens from Kanshirei, June 14th, 1906, and July 11th, 1908; also a male in poor condition and minus antennæ, August 3rd, 1908. Four specimens from Formosa (Wileman) in the British Museum.

Nearest to *H. brachypalpia*, Hampson.

*Hypenagonia minor*, sp. n.

♂. Head and thorax whitish, the latter brown tinged; abdomen brownish also whitish but inclining to brown at base. Fore wings angled at vein 3, apex pointed; whitish, suffused with pale brown, faintly dotted with black on costa; medial band rather dark brown enclosing traces of a whitish line, inner edge dark brown and almost straight, outer edge diffuse obtusely angled above middle; discoidal mark blackish, edged with whitish, a black dot at each extremity; subterminal dots black, more or less connected towards costa, preceded by an interrupted and irregular brown band; fringes whitish, brown at base. Hind wings whitish, suffused with pale brown chiefly on costal and terminal areas; medial line brown, double, blackish discoidal mark on the inner; subterminal dots black, preceded by a brown irregular band; fringes whitish, brown at base.

Expanse, 14 millim.

Collection number, 566.

One example of each sex, the male from Takow (plains), November 1st, 1905; the female from Tainan (plains), September 29th, 1905.

Possibly this may prove to be a small form of *II. angulata*.

*Anepa indentalis*, sp. n.

♂. Antennæ with moderate long bristles. Head whitish, thorax brown, ochreous tinged; abdomen brown, whitish towards the base, tufts rather darker brown. Fore wings brown, ochreous tinged; antemedial line blackish, excurved, indistinct except towards the dorsum; postmedial line whitish, white and outwardly oblique to vein 4 where it turns under the cell, thence almost straight to dorsum; space between antemedial and postmedial line rather darker, a black dot in the cell; subterminal line indicated by seven black dots—three near the costa, two about the middle, and two near dorsum; fringes darker than the ground colour. Hind wings fuscous, fringes paler. Under side pale brown, clouded with blackish on disc of fore wings.

Expanse, 35 millim.

Collection number, 1875.

A male specimen from Kanshirei, April 21st, 1909.

*Neachrostita leechi*, sp. n.

♂. Fore wings pale brown freckled with darker especially on the terminal area; antemedial line black-brown, interrupted about middle; postmedial line black-brown, wavy, elbowed below cell, united with a blackish spot in cell; subterminal line pale, sinuous, inwardly edged on costal area by a black-brown spot; terminal line black, fringes whitish. Hind wings fuscous, discoidal dot and transverse line beyond blackish; terminal line black, fringes whitish. Under side of the fore wings pale brown suffused with darker; hind wings pale brown freckled with darker on the costal area, discoidal lunule and line beyond black.

♀. Similar, but the medial area of the fore wings is whitish and the black-brown clouding less distinct.

Expanse, 15 millim. ♂ ; 18 millim. ♀.

Collection numbers, 1301 ♂ and 1039 ♀.

A male from Arizan (7500 ft.), August 15th, 1908, and a female taken in September, 1906. There is a specimen from Arizan (Wileman) in the British Museum. Also two specimens of a *Neachrostia* from Moupin that are probably referable to this species.

*Neachrostia limbata*, sp. n.

♀. Head and thorax whitish brown flecked with dark brown; abdomen whitish brown marked with darker on the segments. Fore wings whitish brown, freckled with darker, lightly between the antemedial and postmedial lines and heavily beyond the postmedial; antemedial and postmedial lines black-brown, approaching each other above and below the cell; subterminal line pale, sinuous, inwardly clouded with black-brown. Hind wings whitish suffused with fuscous, discoidal dot darker. Under side of fore wings suffused on the disc with fuscous, costa pale brown marked with darker, dorsal area whitish; hind wings whitish marked with brown on costal area, discoidal dot black, postmedial line blackish deeply indented about middle.

Expanse, 18 millim.

Collection number, 1354.

Four rather worn females from Arizan, August, 1908.

Near *N. leechi*.

*Magulaba nigromaculata*, sp. n.

♂. Head and thorax pale grey-brown, minutely speckled with black. Fore wings pale grey-brown finely speckled with black; antemedial and postmedial lines blackish, sinuous; subterminal line pale, wavy, indented on costal area; subterminal and postmedial lines preceded by black marks; the antemedial line is followed by a black mark, and there is a black mark near base of the wing; discoidal bar black, followed by a blackish shade; terminal lunules black; fringes pale brown, inclining to ochreous at the base. Hind wings dark fuscous, terminal lunules black, fringes pale brown ochreous at base. Under side pale brown sprinkled with darker, costa dark brown dotted with whitish; disc of fore wings suffused with dark fuscous; dorsal area of hind wings whiter.

♀. Generally darker and greyer on the fore wings, the hind wings blackish; markings as in the male.

Expanse, 20 millim.

Collection number, 1042.

One example of each sex from Kanshirei, the male taken April 18th, 1906, and the female October 27th, 1908.

Allied to *M. maestalis*, Walk.

*Antarchæa* (?) *sordida*, sp. n.

♂. Head and thorax whitish brown mixed with darker brown; abdomen brown, segmental divisions whitish. Fore wings whitish

brown, suffused and clouded with darker brown; a small black spot in the cell and a white spot at outer end of the cell enclosing a black-brown ring and a brown 8-shaped mark beyond end of the cell; subterminal line pale, costal half bordered inwardly with blackish and followed by some blackish marks; terminal dots black, at ends of the veins. Hind wings whitish, powdered with brown. Under side whitish suffused with fuscous on disc of the fore wings, and sprinkled with brown on the hind wings; all the wings have a dusky discoidal mark and line beyond.

Expanse, 23 millim.

Collection number, 1400.

Two male specimens in rather poor condition from Kanshirei, April 28th, 1908, July 7th, 1908.

*Paragona biangulata*, sp. n.

♂. Pale greyish brown, sprinkled with dark grey; antemedial line blackish, sinuous; discoidal mark black, lunular; postmedial line black, acutely angled at middle and less acutely above middle; subterminal line dark grey, serrated, indistinct; some blackish clouds on terminal area; terminal line black, interrupted; fringes dark grey, pale at the base. Hind wings pale greyish brown sprinkled with darker grey; traces of blackish antemedial line, discoidal mark and some clouds on terminal area blackish; terminal line and fringes as on fore wings.

♀. Similar to the male but somewhat darker in colour.

Expanse, 16 millim. ♂; 18 millim. ♀.

Collection numbers, 550 and 1361.

A male specimen, August 15th, 1905, and a female, May 29th, 1908; both from Kanshirei. There is a specimen from Kanshirei (Wileman) in the British Museum.

## SOME REMARKS ON *THECLA* *ÆSCULI*, Hb.

BY G. T. BETHUNE-BAKER, F.E.S.

I AM most interested in Mr. Rowland-Brown's valuable paper on *Thecla* (or, as I think we should call it *Strymon*) *ilicis* var. *æsculi*. I should be thankful for the elucidation of any species of the Ruridæ that could be undertaken in like manner. There is one thing, however, that has set me wondering, that is why Mr. Rowland-Brown says that I retain *æsculi* as a local form of *ilicis*.\* As a matter of fact I do not think I have ever considered the question, and, strange as it may seem, I cannot recollect ever having taken *æsculi*. I have referred as far as I could, and

\* I was evidently mistaken with regard to Mr. Bethune-Baker's views of the species designated. I have an idea that the identity suggested was derived from an MS. note, but I may be mistaken; and Mr. Bethune-Baker has now resolved the ambiguity for which I was responsible.—H. R.-B.



cannot find that I have ever recorded it in my various Continental tours, but even if I did I merely adopted Staudinger's Catalogue as the best known list. Certainly I have never considered the species critically, and I have not a specimen of *æsculi* of my own capture in my collection. It is very curious that among a long series of var. *cerri* from Digne and other French localities, I have not got a single specimen of *æsculi*. So far as I am concerned I do not regard the cornuti as safe characters. I referred to this matter at the Annual Meeting of the Entomological Society. The armature of the vesica is very minute, and very great caution is necessary in dealing with it; this, however, is rather intimated by Dr. Chapman. To make the decision quite definite it will be necessary to do as Mr. Rowland-Brown at first set out to do, viz. breed both insects through as far as possible side by side so as to be able to make the necessary comparative descriptions, and this I sincerely hope he may do ere many years have past, and, at any rate, I am grateful for his present investigations and article.

### THECLA ÆSCULI IN THE SOUTH OF FRANCE.

By H. ROWLAND-BROWN, M.A., F.E.S.

To the list of Departments (*antea*, p. 205) in which this species is known to occur may be added Gard. Writing in the 'Entomologist,' vol. xxxviii. (1905), p. 52, Dr. A. F. Rosa states that he took specimens of a Theclid at Pont-du-Gard which, at the time, he supposed to belong to *T. acaciæ*. In reply to my enquiry he has kindly supplemented his note as follows:—

"The five other specimens mentioned (*loc. cit.*) under *T. acaciæ* were *æsculi*, and the reason I did not state this was because I could not at the time (nor now) reconcile myself to the idea that they represented a variety of a species of which *cerri* was a member. I reasoned that they could not be *æsculi*, because they were most evidently to me not a variety of *ilicis* (var. *cerri*).

"I wrote to Mr. Tylecote . . . and pointed out to him the difference between the two, and telling him that I believed they represented different species. I enclose herewith his reply in his own handwriting. Though it did not coincide with my views, yet it showed that he agreed with me, and that I then (1905) had the opinion which you have now expressed in your article in the current 'Entomologist.' I give you the characters on which I then based my distinctions between the two:—

General shape: <i>Cerri</i> , ant. marg. fore wings, ♂	} deeper.
post. marg. hind wings	
<i>Æsculi</i> , ,, ,,	} narrower

"Colour: *Cerri*, darker, greyish brown.

*Æsculi*, lighter brownish grey.

"Marginal peacock eyes, hind wings:—

*Cerri*, diminishing rapidly in size as they extend from the anal angle; and somewhat lighter ground-colour.

*Æsculi*, not diminishing in size from the anal angle outwards; somewhat darker than ground-colour.

"Row of spots or white lines, hind wings:—

*Cerri*, extending from anal peacock-eye to nearly middle of costal edge.

*Æsculi*, nearly parallel with hind margin.

"The arrangement of these spots or dashes to one another is quite different in these two species. There is, also, a difference in the shape of the tails."

This latter point Mr. Tylecote emphasises in his communication to Dr. Rosa as follows:—

"(i) *Cerri*: Tails generally thin, and of the same breadth throughout; tips of antennæ dark brown.

"(ii) *Æsculi*: Tails short, and wedge-shaped; tips of antennæ dark brown."

I have again examined the examples of both species in my possession, and recognise Dr. Rosa's additional points of differentiation now brought to notice. Guenée, as recorded, remarks a difference observable between the respective antennæ; but his label in the Oberthür collection does not specify of what these differences actually consist.

Harrow Weald: September 14th, 1915.

## NOTES AND OBSERVATIONS.

ENTOMOLOGICAL CLUB.—A meeting was held at "Hodeslea," Eastbourne, on September 18th, Mr. Robert Adkin being the host. The members and guests assembled at 1 o'clock, and, having partaken of lunch, strolled along the front of the cliffs where such of the local butterflies remained on the wing at this late season of the year were noted, among them *Agriades corydon* and *A. bellargus* flying together in some numbers. After a stiff climb to the "head" tea was taken at the Beachy Head Hotel, the return being made by way of the Paradise Down. The Club supper was held at "Hodeslea," the members present being Messrs. G. T. Porritt, H. St. J. K. Donisthorpe, and the host of the day; the honorary members, Messrs. A. H. Jones and Richard South; and the guests, Messrs. E. J. Bedford, W. L. Distant, A. E. Gibbs, E. P. Sharp, A. E. Tonge, and H. J. Turner. After supper Mr. Turner exhibited a number of specimens of *A. corydon* recently taken at Royston, and Mr. Adkin a living specimen of *Polygonia c-album* taken in the "Hodeslea" garden that morning. Later several of the company returned to

London, but those who were able to stay over the week-end took the opportunity to visit Abbot's Wood, where a pleasant morning was spent, the afternoon being devoted to a well-earned rest in the garden, where the scene was enlivened by the numbers of *Pyrameis atalanta* that visited the flower beds. Some additional interest was manifested in the meeting from the fact that it was held at the house where the late Professor Huxley spent the later years of his life.

RESTING HABIT OF HIPPARCHIA SEMELE.—I was very interested in Mr. Rowland-Brown's note (*antea*, p. 218) on the resting habit of *Hipparchia semele* at Aberdovey, and having recently returned from the same coast, I am able to inform him that as far as my observations went *semele* is confined to the sandhills. My opportunities were limited, as I was very late for this species, but I observed it frequently on the sandhills at Llanbedr (where I was staying), Harlech and, on my single visit, at Aberdovey. I worked very considerably over the country for some six miles back, from Llanbedr and Harlech, and on one occasion for about the same distance behind Portmadoc, but did not see a single specimen, although much of the country is just the kind where one would expect it. Of course it may have been over on the inland ground, but I do not think so, as taking a line through *Pararge megera* (which was very plentiful, these were certainly as fresh—if not fresher—on the higher ground, than by the sea. The habit of lying over on its side that Mr. Rowland-Brown describes is very familiar to me, and I have noticed it much more frequently with *semele* in its chalky and sandhill localities, than when it occurs on peaty ground, but I think the habit is not an uncommon one among Satyridæ. I have certainly observed it in *Epinephele ianira* and *Erebia epiphron*. The habit of resting on pine trunks is also very familiar, and in the New Forest I have even found it settled there after sundown. In general *H. semele* can scarcely be considered a flower-loving butterfly, but on occasions—as Mr. Rowland-Brown found at Aberdovey—it will visit them in some numbers. Two instances occur to me: the first, many years ago at marjoram blossoms in a hollow on the Polegate Downs, and the second in the present year at scabious on the Cliffe Hill, Lewes. On this last occasion the scabious was growing in among long grass, and *semele* was resting on the flowers in considerable numbers. There is much ground behind Llanbedr, apparently exactly similar to that upon which *Lycæna arion* occurs in North Cornwall, but I know of no one who has worked there at the right time. The locality is quite new to me and apparently a very rich one. I hope on some future occasion to have an opportunity of visiting it earlier in the year, when Mr. Arkle's *arion* suggestion could be put to the test.—RUSSELL JAMES; Brockenhurst, Bloomfield Road, Highgate, N., September 16th, 1915.

HIbernated EXAMPLES OF VANESSA ANTIOPA.—In his note in the 'Entomologist' (*antea*, p. 220), Mr. A. H. Jones states that in his opinion *V. antiopa* breeds in this country and adds "why should it not"? I think this question can easily be answered. The number of specimens which survive hibernation in Britain are undoubtedly

very few, and distributed over wide areas; consequently, after hibernation, when pairing takes place, it appears to me extremely probable that the sexes are unable to find each other owing to the localities where they occur being widely separated, and as far as we know hibernated examples do not migrate to these shores in the spring. Mr. Jones further states that we do not properly search for the larvæ. This can hardly be the case, because the larvæ of this insect are very conspicuous and would require but little searching for on account of their gregarious habits, black colouring, and large size; consequently, a brood of these caterpillars during their last two stages, forming a black mass on the foliage of trees would, no doubt, have been readily detected at some time or other by entomologists had they existed here.—F. W. FROHAWK.

LYCÆNA ARION IN NORTH WALES.—Mr. Arkle's reference to the supposed occurrence of *L. arion* at Aberdovey (*antea*, p. 219; *et vide* 'British Butterflies,' J. W. Tutt, vol. iv., p. 354) is probably "*teste* Kerr." Nearly fifty years ago, when a boy, I spent a summer holiday there with my people, and on that occasion I met an old gentleman, a keen entomologist, who was collecting in the district. Even in those days I was possibly keener than most schoolboys about butterflies and moths, and he most kindly helped me in many ways. I still have a copy of Stainton which he gave me. He showed me some boxes of insects he had taken, and amongst them I am almost certain—though at this distance of time I cannot be certain—were some *arion*. What I am certain of is that he told me *arion* occurred on the hills where the Trefiddian Hotel now stands. Some twenty-five years elapsed, but I had not forgotten my old friend and his *arion*, and when an opportunity occurred I visited Aberdovey with a good hope, not to say expectation of seeing the insect. In glorious weather during the first week of July I tramped over the whole district, taking many interesting things, but no *arion* were seen. Since then, many July days have been spent on the hills overlooking the sea between the village and the cemetery. The "Large Blue" has never been sighted. That is the story of the supposed existence of *arion* at Aberdovey. Personally I still believe that it once flew there, though I fear now long extinct, as has happened in other localities for the butterfly in England; though, perhaps, on the evidence I can hardly expect others to be equally convinced. Some five years since I took *arion* freely near Bude, and last year more sparingly on the Cotswolds. I noticed how similar in many ways the localities were to the Aberdovey hills.—W. J. KERR: Falconside, Cromer, September, 1915.

INJURY TO THE WINGS OF LYCÆNA ARION.—I think I can account for the injured specimens of *L. arion* alluded to by Mr. J. H. Grant in his notes on the "Butterflies of the Cotswolds" (*antea*, p. 215). It is the practice of a certain dealer to capture large numbers of specimens for the purpose of examining them for varieties, and all that are found to be normal are marked by removing the apices of the fore wings, and then liberated; by this means they can be recognised, which saves the trouble of recapturing them.—F. W. FROHAWK.



**CUCULLIA LYCHNITIS AND VERBASCI IN THE CHILTERN DISTRICT.**—In the year 1893 I found a few larvæ of *C. lychnitis* feeding on their food-plants on the sides of one of the Chiltern hills. From that time I always associated this species with the dry hillsides, but during the present month I have had cause to modify my views. I came unexpectedly upon a waste piece of land some distance from the hills, and the ground, which was in most places soft and spongy, was covered with a profusion of the golden-yellow flowers of the food-plants. By searching I obtained some dozens of the larvæ of *C. lychnitis* of all sizes, varying from the little larva just emerging to the perils of caterpillar life, to the full-fed individual about to burrow in the soil. It was interesting to note that the smaller larvæ were feeding on the flowers, whilst the largest were bravely attacking the seeds. From the fact that larvæ were taken of various sizes, it is clear that the plants must have been visited by several female moths. No doubt *C. lychnitis* can adapt itself to circumstances in a similar manner as *C. verbasci* does, for at one time or another I have met with this latter larva on hill-tops, in valleys, and by the sides of streams. Until this year I had never met with *C. verbasci* in the Chilterns, but this July I came across plants in the hollows of the hills that had been eaten to a "frazzle" by the larvæ. They had, however, "gone down," and I only met with a single belated individual.—A. J. SPILLER; Chinnor, Oxon., August 24th, 1915.

**ABNORMAL ANTHROCERID (ZYGÆNID) PAIRING.**—M. René Oberthür in a recent letter to me mentions a curious case of abnormal pairing. He writes, under date August 28th last: "There has recently been taken at Vernon, Eure, a Zygænid coupled with *Malacosoma neustria*. This sounds almost incredible, but the old authors who placed the Zygænids near the Bombycids appear to have been somewhere not so far of the mark." There have been several cases reported of abnormal pairing in this group; at one of the recent meetings of the Entomological Society of London I believe that it was stated that a pairing with *Dryis paphia* had been observed.—H. ROWLAND-BROWN; Harrow Weald, September 14th, 1915.

**HIPPARCHIA (SATYRUS) SEMELE AND FLOWERS.**—Respecting Mr. H. Rowland-Brown's remarks on *Hipparchia semele* settling on flowers, I may say that during many years observation I have only very occasionally seen this butterfly settle on flowers; in fact, as far as my memory serves me, it was not until ten years ago that I first saw this species feeding on blossoms, when on July 12th, 1905, at 3 p.m. in Cornwall, I was surprised to see within the space of a few minutes, no less than three *semele* feasting on the nectar of three different kinds of flowers, viz. centaury (*Erythræa centaurium*), bramble (*Rubus fruticosus*), and field thistle (*Carduus acanthoides*). Again, on August 12th last, I observed and captured a female example while settled and feeding on the blossoms of hedge calaminth (*Calamintha clinopodium*).—F. W. FROHAWK; September, 1915.

**ARGYNNIDS IN WEST LONDON.**—On August 13th last I noticed a pair of large Argynnids flying round and settling upon a golden privet hedge in the garden here; I am practically certain the species was *A. aglaia*.—W. R. TAYLOR; 86, The Avenue, West Ealing, W.

**ZIZERA MINIMA IN AUGUST.**—I notice that a second brood of *Zizera minima* is recorded as occurring on the Salisbury downs (*antea*, p. 222). I may say that a partial second brood has also occurred in this district in August for the past two years. These August specimens were nearly all males, and for the most were much larger and finer than the specimens occurring in May-June.—A. T. POSTANS; 55, Raglan Street, Portsmouth, September 13th, 1915.

**EUROIS OCCULTA IN DURHAM.**—Two specimens of *Eurois occulta* were taken from a tree-trunk at Castle Eden, county Durham, on August 21st.—W. R. TAYLOR; 86, The Avenue, West Ealing, W., September 8th, 1915.

**NOTODONTA DODONEA FEEDING ON BEECH.**—On September 1st, 1914, I met with a full-grown larva of the above species feeding on beech in a wood near Watlington. The moth emerged on May 24th, 1915, and was a fine female specimen. About twenty-four years ago I also met with two larvæ on beech trees, and the late Rev. Bernard Smith, of Marlow, told me he had met with a similar occurrence himself.—A. J. SPILLER; Chinnor, Oxon.

**COLIAS EDUSA AT EASTBOURNE.**—I first noticed *Colias edusa* in this neighbourhood on September 5th, when one was seen flying on the downs near the sea, and another on the flowery banks of the parades in front of the town. In this last named position I have also seen one on 13th, two on 17th, and four on 18th, and on 19th one in my garden; they all appeared to be males, and none of them in very fresh condition. My chances of observation have not been frequent, but from the foregoing I should conclude that the species has been by no means rare in this immediate neighbourhood this autumn.—ROBERT ADEIN; "Hodeslea," Eastbourne, September 22nd, 1915.

**COLIAS EDUSA IN ESSEX.**—On September 3rd I saw a specimen on the wing making comparatively slow headway against a strong westerly wind at Thorpe Bay, Essex. As it was some distance from me I could not determine the sex with certainty, but I believe it was a female. This is the only specimen I met with in Essex this year where this species generally occurs.—F. W. FROHAWK; September, 1915.

**COLIAS EDUSA AT BRIGHTON.**—On August 25th a very fine freshly emerged female was netted by F. Jay Arnott in the Devil's Dyke Valley, Poynings, near Brighton. On September 8th a recently emerged male was caught by Mr. F. G. S. Bramwell on the downs close to Stanmer Park, near Brighton. On September 13th a male was observed flying rapidly in the Devil's Dyke Valley by Mossrs. F. G. S. Bramwell and F. J. Arnott.—F. JAY ARNOTT; Springfield Road, Brighton.

**ABERRATION OF VANESSA IO.**—A specimen of *Vanessa io*, which flew into the bedroom of our neighbour, Mrs. Humphry, and which was captured by Miss Rhoda Stubbs, was found to be a fine variety; the eye-spots on the fore wings being replaced with a white suffusion. The spots on the hind wings are as in the type.—JOSEPH ANDERSON; Chichester.

**MULTIPLE COCOONS.**—In the 'Entomologist' there have appeared two records of multiple cocoons, *viz.* a double cocoon of *Habrosyne detersa* (February, 1915, p. 44), and a double cocoon of *Dasychira punitaria* (July, 1915, p. 170). In a brood of larvæ of *Malacosoma neustria* which I reared this year, in one case three larvæ spun up in a large common cocoon on a sprig of hawthorn. The cocoon was of the usual doubled walled structure, but there was no partition whatsoever within the cocoon to divide the pupæ off from one another. The three imagines all made their exit from the cocoon through the same hole.—F. G. MANN; "Oreston," 21, Thurlby Road, West Norwood.

**POLYGONIA C-ALBUM IN SUSSEX.**—On the morning of September 18th, among the number of Vanessids that for the past week or two have been wont to gorge themselves at the flowers of the Michaelmas daisies in my garden at Eastbourne, one was noticed which appeared to differ from the common herd, and, on being secured, it was found to be *Polygonia c-album*. Although as a specimen it is in by no means bad order, it is evident upon a close examination that it had been on the wing for some time before capture.—ROBERT ADKIN; "Hodeslea," Eastbourne.

**SPHINX CONVULVULI AT BRIGHTON.**—One female taken on August 18th in Queen's Park, Brighton, and another in the same locality on September 3rd.—F. JAY ARNOTT.

**SIREX GIGAS AT CHICHESTER.**—Three specimens of *Sirex gigas* (all males) have been taken in this neighbourhood during the month of August. The first on the 9th of the month.—JOSEPH ANDERSON.

**SPHINX CONVULVULI IN HAMPSHIRE.**—I took a fine female specimen yesterday, September 17th, at Hill Head (near Titchfield), Hants. It was crawling on the cliff path just above the beach, unable to fly, but in very fair condition.—R. BARNARD CRUICKSHANK; 22, The Crescent, Alverstoke, Hants, September 18th, 1915.

**SPHINX CONVULVULI IN LANCASHIRE.**—It is so seldom that one of these visitors is recorded from the Southport district, that perhaps it may be worth mentioning a capture in Ainsdale on August 22nd last. The specimen is in the collection of Mr. Stanley Gibson, Ainsdale.—W. A. TYERMAN; 4, Cathedral Mansions, Huskisson Street, Liverpool.

**SPHINX CONVULVULI IN SCOTLAND.**—The last time I wrote to the 'Entomologist' was in 1897-98, on some of the Lepidoptera of Tirah. Many years have rolled by, and now again, during wars alarms, I feel constrained to report to you the occurrence of a *Sphinx convulvuli* asleep on the fence outside camp here, where I left it undisturbed. Strong northerly winds have prevailed the last few days, and my sleepy friend had travelled and slightly frayed his wings.—K. DINGWALL (Major); Tenth (Service) Battalion, Seaforth Highlanders, Tain, Ross-shire, N.B., August 24th, 1915.

**ERRATUM.**—Page 221 (line 25 from bottom) for "ragwort" read "mugwort."

## SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*Wednesday, May 5th, 1915.*—The Hon. N. C. Rothschild, M.A., F.L.S., F.Z.S., President, in the chair.—Following on his exhibits and notes of March 3rd last, Mr. Newman again exhibited living pupæ of *Pyrameis atalanta*, and said he thought he might now fairly claim to have proved that this species can pass the winter in England in this condition.—Mr. Talbot exhibited specimens of the genera *Hyades* and *Tenaris*; also, on behalf of Mr. J. J. Joicey, some new Lepidoptera from the Arfak Mountains, Dutch New Guinea.—The Rev. F. D. Morice drew attention to a paper in the Trans. Ent. Soc. vol. i. (1836) by W. Spence on "The Italian Mode of Exclusion of the House-fly."—Prof. Poulton read "Further Notes on the Habits of the African Ant *Megaponera foetens*, F.," an account sent to him March 27th, 1915, by Mr. C. O. Farquharson. He also exhibited specimens from a collection kindly sent to the Ilopo Department by Archdeacon G. K. Kestell-Cornish from Ambinanindrano, Mahanoro, Madagascar (about 400 ft.). Also a Uganda bug devouring a Lycaenid butterfly.—He also read a letter from Dr. G. D. H. Carpenter containing observations on butterflies and the attacks made on them by birds, about thirty miles W. of the Victoria Nyanza and about 1 deg. S. lat.—The following papers were read: "New Lepidoptera from New Guinea," by J. J. Joicey, F.L.S., F.E.S., A. Noakes, F.E.S., and G. Talbot, F.E.S.; "Descriptions of South American Micro-Lepidoptera," by E. Meyrick, B.A., F.R.S., F.E.S.; "Life-History of *Caligo memnon*," by F. L. Davis, M.D., F.E.S.; "Some Palearctic Species of *Cerâdegaster*," by Kenneth J. Morton, F.H.S.; "Experiments on some Carnivorous Insects," by C. E. M. Swynner-ton, F.E.S.

*Wednesday, June 2nd.*—The Hon. N. Charles Rothschild, M.A., F.L.S., F.Z.S., President, in the chair.—Dr. A. B. Northcote, Blenheim House, Monkgate, York, was elected a Fellow of the Society.—Dr. Chapman exhibited some full-fed larvæ of *Agriotes escheri* bred from the egg.—Mr. O. E. Janson, specimens of *Ornithoptera alexandrae* selected from a series to show the extreme variations in the wing-markings; also a female example of *Morphoteris kenricki*; all from New Guinea.—Mr. C. B. Williams, a method of breeding *Psocidae* and other small insects which feed on fungi, &c.—The Rev. F. D. Morice, a female of the solitary bee *Andrena labialis* taken near Woking on May 19th, 1915, having attached to the disc of its clypeus a vegetable substance, apparently a pollinium of some orchid.—Mr. Donisthorpe, specimens of the ants *Anochetus cameroni*, Forel, a new species taken by Dr. Cameron at San Roque, December, 1914, and *Crematogaster inflata*, F. Smith, taken by Mr. Bryant at Serawak, December, 1913.—Prof. Poulton read "Further Observations on African Insects by Dr. G. D. H. Carpenter."—Dr. Eltringham exhibited a family of five examples of *Acrea johnstoni*, Godm., bred by the Rev. K. St. A. Rogers at Sagalla, B.E.A., together with the female parent.—Comm. Walker, living specimens of *Elatér*



*sanguinolentus*, beaten from *Pinus sylvestris* at Brockenhurst on the morning of the meeting.—The following paper was read: "What the Larva of *Lycana arion* does during its last instar," by T. A. Chapman, M.D., F.Z.S., F.E.S.—GEO. WHEELER, M.A., *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 22nd.*—Mr. A. E. Gibbs, F.L.S., Vice-President, in the chair.—Mr. Newman exhibited living examples of a species of Braconid which had just emerged from a batch of ova of *Macrothylacia rubi* found at Rutham in the autumn of 1914.—Dr. Chapman, specimens *Lattiorina pyrenaica*, the first that had been bred, from the Pyrenees; and also *L. orbitulus* var. *oberthüri* from the same area, but found also in Switzerland. He also showed specimens of *Agriades escheri* var. *rondoui*, bred from the egg, and pointed out their distinction from the form known as ab. *rondoui* from Gavarnie. He showed living specimens of the Ichneumon *Aphalius ervi*, bred from the aphid of *Ononis arvensis*.—Mr. B. H. Curwen, some first-brood females of *Polyommatus icarus*, from Rammore Common, all much suffused with blue; and several under side aberration *melanotoxa* (*arcuata*). He also showed a series of *Syntomis phegea*, interbred for the past four years.—Mr. Sieh, coloured drawings of the larvæ of the British species of *Acronieta*, and pointed out the difference between the larvæ of *Triena psi* and *T. tridens*.—Mr. B. Adkin, long series of *Apatura iris*, from many British localities; and showed that the species was much more varied than it was usually considered to be. A considerable discussion took place on the occurrence and disappearance of the species in its near London localities.—Mr. R. Adkin, living larvæ, pupæ, and imagines of *Ephestia kühniella* in rice flour.—Several members gave experiences of the present season, making remarks on *Agriades thetis*, *Polyommatus icarus* (abs. of females), *Celastrina argiolus*, *Pyrameis cardui*, *P. atalanta*, *Lithosia complanula*, *Euchloë cardamines*.

*August 12th.*—Mr. B. H. Smith, President, in the chair.—Mr. B. H. Smith exhibited a number of Lepidoptera from New Zealand, including Chrysophonids, Lycenids, and species of the giant Hepialids.—Mr. B. S. Williams, *Anthrocera trifolii* var. *palustris*, with confluent forms from Somerset, and an aberration of *Xanthorhœ sociata*, in which the usual dark band on the disc of the left fore wing was reduced to a blotch on the inner margin.—Mr. West (Ashted), the ova of *Chrysopa perla*.—Mr. Hy. J. Turner, examples of an excessively local form of *Brenthis pales* var. *arsilache*, taken by him on one side of one small lake at St. Moritz, Engadine, at flowers of *Cornarum palustre*, the marsh cinquefoil. He also showed a series of forms of *Parasemia plantaginis* from the Engadine, varying from the normal yellow and black males to the form with a much extended white ground on the one hand, and on the other hand, to the form with a much extended black area.—Mr. Edwards read his report as delegate of the Congress of the S.-E. Union of Scientific Societies at Brighton.—HY. J. TURNER, *Hon. Rep. Secretary*.

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## NEW MUTILLIDÆ FROM CALIFORNIA.

By T. D. A. COCKERELL.

DURING a recent visit to California I obtained a number of Mutillidæ, among which I find three undescribed species.

### *Dasymutilla aletina*, n. sp.

♂. Length about 8 mm., slender, integument entirely black; top of head, mesothorax and scutellum, abdomen above beyond basal third of second segment, and sides of segments 3 to 5 below, with very long, erect, very bright red hair, with a distinct crimson tint, and no appressed hair at its base; rest of hair on head and body, and that on legs, black; mandibles bidentate, not enlarged; clypeus with a median projection on lower margin; eyes nearly spherical, not at all emarginate, minutely faceted; ocelli small; mesothorax coarsely and strongly punctured; metathorax rounded, dull, very coarsely cancellate; tegulæ piceous; wings black, slightly pallid in the region of the marginal and submarginal cells; second submarginal cell not narrowed to a point above; first abdominal segment nodose, very coarsely and densely punctured, the suture between it and second deeply constricted, ventral keel ending in a sharp tooth which projects downward and backward; second ventral segment strongly punctured, but flattened and scarcely punctured in middle, the following ventral segments punctured only along hind margin.

*Hab.*—Avalon, Catalina Island, California, middle of August, 1915 (*Aleta Venable & Hazel Andrews*). Allied to *D. coccineohirta*, Blake, but differing in the venation, the entirely black tegument, and the small and slender form.

### *Dasymutilla sumneriella*, n. sp.

♀. Length about 9.5 mm.; moderately robust, the thorax conspicuously narrower than the abdomen, the head scarcely as wide as the thorax; eyes nearly circular, smooth and shining; first abdominal segment broad, sessile on the second; upper part of head, including cheeks and front, and dorsal surface of thorax and abdomen, with the tegument red, and this closely covered with erect and appressed

very bright red hair; antennæ brownish, scape strongly curved; prominent red tubercles at bases of antennæ; face and lower side of head, and legs, with very long dull white hair; posterior lateral margins of metathorax not dentate; posterior sides of thorax forming deeply excavated basins, impunctate in middle; ventral keel of first abdominal segment large, prominent, truncate, somewhat as in *D. medea*; first two ventral segments of abdomen with whitish hair, the others with red; pygidial plate very well defined, striated.

*Hab.*—La Jolla, California, August (*Cockerell*). Named after Dr. F. B. Sumner, who kindly helped me to collect Mutillidæ on the grounds of the Scripps Institution for Biological Research at La Jolla. In addition to the new species, we found *D. pacifica*, Cresson, and *Nomiaphagus harpalyce*, Fox, the latter quite common. *D. sumneriella* is related to *D. creusa*, Cress., but is easily known by the abdomen above being covered with bright red hair, even at the base.

*Nomiaphagus acuum*, n. sp.

♀. Length about 8 mm.; clear ferruginous, including legs and antennæ, apical part of the tridentate mandibles (formed as in *Pseudomethoca canadensis*) black; eyes broadly suboval, smooth and shining; third antennal joint a little more than half as long as fourth; head very broad, quadrate, face sunken and abbreviated; face with thin long white hair; cheeks with appressed silvery hair; front and whole of top of head densely covered with appressed pale golden hair, with scattered erect yellowish-white hairs also; thorax rather short, fiddle-shaped when seen from above, the margins of metathorax strongly dentate; metapleura smooth and shining, impunctate; dorsal surface of thorax with appressed copper-red hair, not hiding the densely and coarsely punctured surface; anteriorly there is a thin wide band of blackish hair, and at the sides of metathorax silvery hair, there are also scanty erect hairs, partly dark; legs with thin silvery hair; abdomen pyriform, the first segment completely sessile on the second; first segment with long erect white hair basally, appressed brilliantly silvery hair apicolaterally, and appressed black hair on apical middle; second segment dorsally with appressed bright copper-red hair, the apical margin very broadly covered with a band of black, and the sides (invading the coppery area beyond the middle) with thin silvery hair; segments 3 to 5 with appressed silver hair and scattered erect hairs; pygidial plate well-defined, microscopically irregularly cancellate, but largely surrounded and covered by shining reddish-golden hairs; first ventral segment without a prominent keel.

*Hab.*—Needles, California, in the railway station, August 28th, 1915 (*Hazel Andrews & T. D. A. Cockerell*). A distinct species, readily known by the large head covered with pale golden hair. It recalls *Pseudomethoca scævolella*, Ckll. & Casad.

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IS *THECLA ÆSCULI*, Hb., A SWISS INSECT?

By F. E. LOWE, M.A., F.E.S.

MR. ROWLAND-BROWN'S interesting and enlightening article, "Some Remarks on *Thecla æsculi*, Hb.," in the 'Entomologist' of September last, awoke again in me the question at the head of this note. And I set out to work through my Theclids in the hopes of solving the problem. I am now convinced that, whether *T. æsculi* is a separate species or a variety of *T. ilicis*, at least it is certain that the butterfly which has passed as ab. *æsculi* from Swiss localities differs much more from the *æsculi* of Southern France than it does from typical *ilicis*, and that the butterfly we take in Switzerland is an undoubted form of *ilicis*, whose only claim to be called var. *æsculi* is that it lacks the white line on the under side of the upper wings.\* To this I would give the name of "*pseudæsculi*," though, except for this agreement in the absence of the white line, there is practically no other likeness to *æsculi*, but it is in every other respect a typical *ilicis*. Whereas, *æsculi* from the South of France and La Granja differs consistently in almost all points from *ilicis*, and while showing some variation, *inter se*, always exhibits certain distinctive qualities of its own. It differs in size, shape, colour, markings, and wing-tails. I have never attempted the difficult study of the construction and comparison of the male appendages, and judge only by examination of the outward appearance. From externals, *æsculi*, Hb., appears to me much nearer akin to *acaciæ* than to *ilicis*. For many years I was content to believe that any specimen destitute of that white line was var. *æsculi*, following the lead of other collectors and authors, who probably, like myself, had never come into the happy relations of a field-naturalist with the southern insect. But, when I took *T. æsculi* in Spain, and later in various localities in the South of France, I began seriously to question the validity of the Swiss and Tirolese examples' claim to the title.

I venture to propose a comparison of certain differences, as I see them, between Swiss *pseudæsculi* and *æsculi*. My specimens of the former come from Ecclépens, Aigle, Martigny, and other parts of the Rhone Valley, Innsbruck, and Bozen.

The chief points for comparison are: (1) the colour; (2) white lines; (3) red spots; (4) tails.

(1) The colour to my eye differs but little on the upper side, but on the under side *pseudæsculi* is deep coffee-brown, while *æsculi* is hardly brown at all, but a dark grey with something of

\* Mr. Harold Powell is of the same opinion as Mr. Lowe. He says (*in litt.*) that he regards all Swiss "*æsculi*" as a form only of *ilicis*.—H. R.-E.



a sheen upon it. Both above and below *æsculi* is very like *acaciæ* in colour.

(2) The white line on the under side hind wings in Swiss specimens (*pseudæsculi*), as in all typical *ilicis* of France or elsewhere, is much more rudely broken up into acute zigzags, the apex of each being sharp and forming an inverted V, and the sharp point of the second, counting from the anal angle, approaching much nearer and with more decision the red chevrons, and on account of its greater irregularity the line is less parallel with the hind margin than in *æsculi*. The dark almost black edging on the inner side of this white line is much stronger in *pseudæsculi* than in *æsculi*.

In *æsculi* from France and Spain the white line is scarcely broken, but runs in regular undulations without sharp angles at apex of the waves, and the second semi-detached curve projecting much less towards the red chevrons than in the other.

N.B.—I have two beautiful specimens from La Granja which have not a trace of white on *either* wing\* (one of these is suffused with yellow upper side with spots on hind margin of lower wings—var. *auronitens*); the red spots are very firm, regular, and continuous round the whole outer margin, without any black setting.

(3) The red spots. The colour in Swiss specimens is always an orange-red of different depths. In the true *æsculi* I think never, but a brownish-red, often very intense, but without any orange tone whatever. The Swiss insects have this row of red chevrons generally composed of two large or double spots next the anal angle, and three more rapidly diminishing in size as they approach the upper margin, till the last is often little more than a haze. The dark setting of these spots is much broader and blacker than in *æsculi*. *Æsculi* has three spots much *rounder*, and hardly appreciably diminishing in size as they ascend, often continuing round the whole outer edge of the wing in French examples, so making seven to eight spots in all. In those from La Granja these red spots are almost entirely absent, and represented only by the three nearest the anal angle, but still maintaining their special form and distinctive colour.

(4) Of the wing-tails I will only say that Mr. Tylecote (p. 241) describes the difference just as it appears to me. Seitz strangely describes *esculi* (sic) as a small form with rather a *long* tail. His plate figures only on the *upper* side, and hence is valueless, and might represent anyone of this group as well as another.

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\* Examples from Le Vernet exhibit same characteristic loss of the white lines.—H. R.-B.

## SOME NOTES ON THE PAPILIONIDS.

BY CECIL FLOERSHEIM, F.E.S.

(Continued from p. 229.)

(5) *P. polyxenes* (*asterias*).—This butterfly, an inhabitant of Southern Canada and the Central and Southern United States of America, belongs to the Umbelliferæ-feeding branch of the Papilioninæ, and is most likely sprung from the same original stock as our own *P. machaon*. It is, however, sexually dimorphic, the female differing greatly both in size and in colour from the male, and being, like that of the dark southern variety of *Jasoniades glaucus*, probably a mimic of *Laertias philenor*. In its earlier stages it closely resembles *Papilio machaon*, except that the larva when full-grown has the black bands on each segment more broken, and the red spots replaced by yellow ones. The pupa tapers rather more in the abdominal segments than that of *machaon*. I have found this species easy to breed in my butterfly-house, where the female oviposits freely on fennel, unlike that of *machaon*, which with me shows a decided preference for laying its eggs on *Skimmia* (natural order Rutaceæ). I think that there would be no difficulty in getting *polyxenes* to establish itself in Southern Europe, though in England its fixed habit of being at least double-brooded would prevent it from ever becoming naturalized. It is not a particularly rapid feeder-up, and only in exceptionally hot summers, like that of 1911, would it be able to complete its transformations here for the second time. Some years ago I was fortunate enough to obtain a pairing of this species, female with *P. machaon* male. The resulting larvæ fed up well and quickly on fennel, and resembled typical *polyxenes*, but in trying to obtain a second brood I forced the pupæ in a vinery, and by subjecting them to too great heat killed most of them. The pupæ, like the larvæ, were indistinguishable from normal *polyxenes*. The few imagines that emerged were all males. They also seemed to be typical *polyxenes*, though one of them paired readily with a female *machaon*, which unfortunately was drowned the next night during a heavy thunderstorm. It would appear that *polyxenes* is the Mendelian dominant in this case.

(6) *P. zolicaon*.—I was only once able to obtain pupæ of this butterfly, an inhabitant of the Western United States of America and Vancouver, in any quantity. It is an even nearer relative of *machaon* than the preceding species, the differences between it and its English relation being exceedingly small. I had intended if possible to cross them, but my *zolicaon* began to emerge at the end of April, three weeks before *machaon*, which I have always found constant to May 20th or thereabouts, whatever the season is like. In consequence of this most of my *zolicaon* were dead

before my *machaon* began to put in an appearance, and I did not notice any pairings between the two species. It is a curious fact, however, that for three or four years after a certain proportion of my *machaon* larvæ exhibited the blue-green ground-colour of *zolicaon* when full-grown, though the pupæ and imagines seemed in all respects normal *machaon*. This state of things continued until three years ago, when an irruption of field-mice into my butterfly-house, and an exceptionally cold and wet August, obliged me to replenish my stock of *machaon*. From my small experience with *zolicaon* I should say that it is habitually double-brooded, but though in the year in which I bred it unfavourable weather conditions prevented me from obtaining pupæ of the second generation, its early date of emergence, and the fact that April is usually a fine and dry month with us, should give it some chance of establishing itself, if introduced into Southern England.

(7) *Iphiclides ajax*.—This beautiful insect is the principal North American representative of the great branch of the Papilioninæ known as the kite swallow-tails, and is said to be common everywhere in the United States of America, where its food-plant, *Asimina triloba*, papaw (natural order Anonaceæ, i.e. custard apples) is found. Though it is a near relative of the European *Iphiclides podalirius*, to which species it bears a striking general resemblance in all its stages, unlike the latter, which is the most refractory species in captivity with which I have ever had to deal, it takes very kindly to the conditions in my butterfly-house, feeding, pairing, and ovipositing freely there. Apart from the objection that it is seasonably polymorphic in its native country, where the four varieties of its two broods used to be mistaken for as many separate species, the fact that the food-plant to which it would seem to be confined, *Asimina triloba*, is only half hardy, and is grown but seldom in England, would seem an insuperable objection to its ever succeeding here. It has been suggested, I think by Edwards, that as it has been observed in parts of the United States of America where the papaw is not found, it must have some other means of sustenance; and with the view of discovering what this may be I have tried to induce the imagines to lay their eggs, and the larvæ to feed on plants belonging to the families represented here which are most nearly related to the Anonaceæ. In this I have been quite unsuccessful, the butterflies generally choosing to die with their ova unlaidd and the larvæ to starve, rather than exchange the usual pabulum of the species for *Cocculus* or *Berberis* or any other allied plants. In one instance, in the absence of *Asimina*, one of my *I. ajax* oviposited on a plant of *Aristolochia siphio* growing in my butterfly-house, but the larvæ died at once after feeding on it. On another occasion, also in the absence of *Asimina*, I saw a female of the spring



brood oviposit on the dead stump of a birch tree, attracted possibly by the fact that the corresponding brood in America lays its eggs before the papaw is in leaf. Perhaps in their choice of food-plant butterflies may sometimes be guided by other senses than that of scent. In this connection I may mention that while with this exception I have never known my *Papilios* to oviposit on anything but a growing plant, shrub, or tree, the moths I have bred in my butterfly-house have usually laid their eggs haphazard on the gauze covering the roof and sides, and this even when their food-plants have been present in abundance.

(S) *P. bianor*.—This fine and interesting butterfly is a member of a somewhat ill-defined group of the *Papilioninae*, of which *Papilio paris* is perhaps the most familiar species. It inhabits the whole of Eastern Asia from Eastern Siberia and Japan to Southern China. Judging from the great range of variation shown both in size and in colouring by the specimens I have bred, I should think it possible, from the descriptions given by Leech and others, that some of the forms of this group which have been given specific names may in reality be only local or seasonal varieties of *Papilio bianor*. It is not seasonally dimorphic, though individuals of the summer brood are in some cases larger than any of the spring ones, and the glossy green scales which powder the upper side of the wings are, in the females, of a browner or more golden green than in the earlier imagines.

The ovum, which is spherical, is of a pale green when first laid, darkening in colour before the emergence of the larva, and, like the pupa, is relatively small considering the size of the larva and imago. The larva in its first stadium is light brown, with two prominences like horns one on each side below the head. At its second instar it acquires the characteristic saddle-markings of so many of the *Papilionid* larvæ, which it keeps until its last stadium, being during the middle part of its existence usually of a dull olive-green though sometimes olive-brown, and with a glistening surface to its skin, which gives it a slimy appearance like that of some bird-droppings. In its last stadium, like most but not all of the *Papilionid* larvæ with which I am acquainted, it is without that characteristic saddle-marking. Its skin has now lost the viscous look, and it is of a clear olive-green, darker on the back than on the sides, and speckled with small blue dots. It has transverse dark green stripes on the sides of its middle segments, and has a white stripe on each side extending from immediately above the first pair of prolegs to the anal claspers. In addition to these markings it has on each side of the swollen segments behind the head a large dark ocellated spot, often rimmed with red, with a pale centre, which has the appearance of an eye. While behind these a black slit across



the back heightens the likeness to the head of some strange creature. The pupa, which is generally of a bright leaf-green in colour, is flattened in shape and almost oval. It has generally a rim of pink, but sometimes a narrower one of dull white, on each side, which combined with a narrow ridge of white which runs down its back gives it almost the exact appearance of a thick evergreen leaf, such as that of *Skimmia*, with the sunlight playing on it. There are two other forms of the pupa; one of a uniform pale brown, and one with the exact colour and markings of a lichen on stone, but these are relatively scarce, not amounting together to more than one in a hundred as far as I have been able to observe.

In all its earlier stages this species exhibits an extreme love of secrecy. The ovum is laid singly, for the most part on the under side of a leaf of the old growth of *Skimmia*, the female often fluttering as low down as possible, sometimes even deep in the middle of the bush, for the purpose. This habit is unlike those of *xuthus*, *machaon*, or any other *Skimmia*-feeding *Papilio* with which I am acquainted, which invariably choose the side shoots or the topmost sprays of the new growth for oviposition. The larvæ, which are lethargic in habit and seldom move except when food fails them, live on a silken carpet which they spin on the upper side of a leaf, in most cases only coming up gradually towards the light as they grow larger, and often remaining hidden all their lives. Even when full-grown they show a distinct tendency to hide themselves on the stem under the topmost leaves; and this in spite of the fact that no Papilionid larva known to me harmonizes more perfectly with its surroundings than that of *bianor* in its later stages. In the comparatively few instances when I have observed it sunning itself on the top of the bushes, it is extremely difficult to detect. In consequence of this I find it hard to estimate the number of ova or larvæ of this species that my butterfly-house contains at any particular moment, and in the past season I had the unwelcome experience of finding my *Skimmia* bushes stripped by what proved to be literally thousands of *bianor* larvæ which I had been harbouring for weeks, without in the least suspecting their presence in any such quantity. The larva, which keeps its love of remaining hidden to the end, usually pupates on the food-plant itself, a favourite position being on the stem of a slender twig amongst the lowest leaves a few inches only from the bottom of the bush. I have found, however, in the case of those individuals which give rise to the partial second brood, pupation takes place near the top of the bushes or even on the under side of the broad leaves of the plant of *Aristolochia siphon* which overhang them, I suppose because in such a position the pupa would receive the greater amount of sunlight which is necessary for its more rapid development. A curious fact in regard to this species

is the abnormal diversity of time taken in feeding-up by different larvæ. For instance, I have to-day, on October 17th, laggards of the first brood which are not yet fully grown, though the first imagines of the second brood emerged on August 10th, and the last ova of the parent butterflies were laid on or about June 27th.

Of all the species with which I have experimented *Papilio bianor* adapts itself most readily to the conditions of my butterfly-house; the imago, in spite of its powerful and dashing flight, making itself quite at home there, and living in its semi-captivity often for as long as five weeks. The larvæ, too, I have found to be less exposed to the attacks of insect or Arachnid foes than those of any other non-pharmacophagous species which I have bred. The newly-formed pupa, however, suffers from the minute black fly which infests my butterfly-house, though I have not found the pupæ of *bianor* which I have received from Japan to contain any of the larger Ichneumonidæ or Diptera. In the matter of food-plant this species seems, with one notable exception, to be confined to various kinds of Rutaceæ. In my butterfly-house *Skimmia* is undoubtedly the favourite of these, the females seldom choosing any other plant when this is available. It will, however, feed readily on *Ptelea trifoliata*, less so on *Aegle sepiaria* (*Citrus trifoliata*). Out-of-doors I have found the larvæ on dittany (*Dictamnus fraxinella*), but not, as I have often found those of *xuthus*, on *Phellodendron amurense*. In several instances during the past season, when their supply of *Skimmia* had run short, I found the half- and full-grown larvæ making an occasional meal of *Aristolochia siphon* without apparently any ill result to themselves. I have never known other Papilionid larva, except those of the *Aristolochia*-feeding species, able or willing to do this (cf. Tutt's 'A Natural History of British Butterflies,' vol. iii. part xviii. p. 40). I may here mention one other fact of interest in connection with this butterfly. In the summer of 1911, the first occasion on which I was able to procure the pupæ from Japan, only one imago emerged, a slightly crippled female, which lived for almost six weeks in my butterfly-house, and though unmated oviposited freely on *Skimmia*. As might have been expected, none of the ova hatched out. In no other instance have I known an unfertilized female of any of the Papilioninæ to lay her eggs.

I feel that I have described the appearance and habits of this species in its earlier stages at great, perhaps inordinate, length. I must plead in extenuation that I have not hitherto succeeded in meeting with any full description of them in the text-books. Besides this there is, in my opinion, a greater likelihood of *bianor* being able to establish itself in this country than any other species of foreign *Papilio* I have bred, with the exception of *philenor*. And it has the advantage even over *philenor* of a less restricted food-plant; *Dictamnus fraxinella* and *Skimmia*

both being grown fairly commonly in this neighbourhood, to say nothing of the other members of the Rutaceæ on which it may feed. It is only during the last two years that I have been able to obtain the pupæ in sufficient quantities to breed from them, and as both summers have proved somewhat cool ones I should not perhaps be justified in concluding that *bianor* is always single-brooded in the conditions which obtain in the South of England. I may mention, however, that in 1914 about 75 per cent. of the pupæ of the spring brood did not disclose imagines until the following spring, and that this year an even larger percentage show every sign of doing the same.

(To be continued.)

*Errata*.—Page 226, line 35, *et seq.*, *Euphocades troilus* should be *Euphocades troilus*. Line 37, *Iphiclides ajax* (*turnus*) should read *Iphiclides ajax*; *turnus*, of course, being a synonym of *Jasione glaucus*. Page 228, line 29, *Benzoni* should be *Benzoin*, and line 31, *et seq.*, *Lindera benzoni* should be *Lindera benzoin*.

## NOTES ON NEW AND LITTLE KNOWN BRITISH APHIDES.

BY FRED V. THEOBALD, M.A., F.E.S., &c.

### I.

THE Aphididæ recorded here, which I have found or which have been sent me during the last few years, are either new to the British Fauna, or have not been recorded since the time of their description; whilst a few are described for the first time. The number of British species is rapidly increasing, and many new species are constantly being found.

1. *Idiopterus nephrolepidis*, Davis.—This very marked and pretty aphid was described by Davis in 1909 (Ann. Ent. Soc. Am. ii. p. 198) from ferns in America. Specimens of alate viviparous and apterous viviparous females were sent me by Mr. Gough, of the Board of Agriculture, on August 21st, taken on *Polygonum* in a glasshouse near London. Again, on October 7th, more apteræ were received from another nursery near London. The peculiar venation and the ornamentation of the wings, the marked white spots on the black body of the apteræ and the white legs, make it a very conspicuous species. It causes the tender leaves of the ferns to curl up, and is said to be very harmful to ferns under glass in America. Mr. Gough wrote me that one grower told him that this aphid quite blackened the tops of the ferns in his houses, but that it was controlled by the use of insecticides. It is probably an introduced tropical species both here and in America.



2. *Aphis chærophyllii*, Koch.—Described by Koch in 1857 ('Die Pflanzenläuse,' p. 79, figs. 104–106) from *Chærophyllum temulum*. Specimens were sent me on July 17th, 1915, by Dr. Durham, who found it in quantities on *Chærophyllum tuberosum* at Hereford. Most were alate viviparous females and a few apteræ and nymphæ. This dark species gives a fine pale violet tint in 70 per cent. alcohol, not the rich port wine red of *Aphis rumicis*. Later Dr. Durham wrote me that the plants had been ruined by this insect.

3. *Aphis apposita*, Walker.—This insect does not seem to have been found since Walker described it in 1850 ('Zoologist,' viii. p. ciii. App.). Specimens from groundsel (*Senecio vulgaris*) were sent me on August 27th, 1915, from Windermere by Mr. A. W. Rymer Roberts. They were all apterous viviparous females, and were sheltering in the unopened flower heads. They are very sluggish in nature.

4. *Aphis chrysanthemi*, Koch.—This species described by Koch in 1857 (Die Pflanz. p. 73, figs. 95 and 96) must not be confused with the *Aphis chrysanthemi* of Walker ('Zoologist,' vii. p. lvi. App.). Koch's species was described from specimens on *Chrysanthemum leucanthemum*, the "ox-eye daisy," and *Matricaria chamomilla*, the "wild chamomile." Walker's from the former plant only. I found this aphid on August 2nd at Wye on the wild and cultivated ox-eye daisies. They were all apteræ, and clustered in dense masses up the flower stalks of the cultivated kinds and under the leaves of both. They occurred in such large colonies that the blossoms became stunted and many died. Some colonies were six inches long. The colour of the aphides was dull greenish-black; a few individuals were shiny. On August 6th a few nymphæ appeared, and I hoped to rear the alate female. But by the 14th practically all the colonies had died off from an attack of parasites. On August the 30th the same insect occurred again on *Matricaria chamomilla* close to the attacked daisies. This species was largely attended by ants (*Lasius fuliginosus*).

5. *Aphis crategi*, Kalténbach.—This aphid does not seem to have been recorded in Britain. Buckton's *Aphis crategi*, Kalt. (Mono. Brit. Aphid. ii. p. 35, pl. xlvii. figs. 1–3) is certainly not Kalténbach's species (Mono. Fam. Pflanz. p. 66, 1843). This insect was taken by me several years ago on apples at Marden, Kent, where it did some damage and was recorded as *Aphis sorbi*, Kalt., and also on hawthorn at Wye in May, 1910, but no alate females could be obtained. On May 23rd, 1914, Mr. Rymer Roberts sent me specimens taken on the hawthorn at Alice House, Windermere. These colonies consisted of alate females, many nymphæ, and a few apteræ. As this insect is of economic importance on account of its attacking the apple, I append a new short description of it:—



*Alate viviparous female*.—Black and shiny with a band covered with snow white meal at the base of the abdomen, beneath which it is pure white, creamy white, pale pink and more rarely pale greenish, and on this pale area are a few dark spots; the posterior part of the abdomen may be pale colour, with narrow transverse dark bars, and there are two pairs of submedian papillæ behind and five pairs of lateral black papillæ before the cornicles; the venter is pale whitish-pink covered with white meal. The black antennæ are shorter than the body, the third segment having 64–70 sensoria; the fourth with 25–30. The proboscis reaches to the third pair of legs. Cornicles black, rather short, cylindrical, imbricated, in some slightly expanding at the base. Cauda black, blunt, with two pairs of lateral hairs. Legs black, except base of femora, which are yellow. Insertions of the wings yellowish. Length 1·8 to 2 mm.

*The apterous females* vary from dark blackish- or greyish-green to black, and are covered with white meal; when denuded some are shiny; antennæ shorter than the body, of five segments only, the third very long; venter deep greenish. Cauda black. Cornicles short and black. Legs black. Length 2 mm.

The *nymphæ* are either fawn-coloured and mealy, with dark eyes, dusky legs, black cornicles, and wing pads of pale to deep green with similar coloured legs, &c., to the former.

The *food-plants* are *Cratægus*, *Pyrus mali* and *Pyrus communis*, as described by Kaltenbach. They gall or blister the leaves of the hawthorn and apple, which become yellowish and red and rosy-pink; at one time the midrib region is deformed, at others the leaf may be bent over at the edges, or any part may become abnormal; beneath or between the galled areas the plant lice feed and breed.

6. *Aphis symphiti*, Schrank. — This aphid, described by Schrank (Fn. Boic. ii. 107, 1801), and redescribed by Kaltenbach (Mono. Pflanz. p. 61, (1843) from *Symphitum officinale*, is also referred to and described by Koch (Die Pflanz. p. 72, figs. 93 and 94), from the same plant. In July, 1914, I found this species in my garden in small numbers on *Anchusa italica*. Most were apteræ and a few nymphæ. They occurred on and inside the blue flowers, in some cases three or four mature females and many young. Lichtenstein records this aphid from *Anchusa*. The apterous females varied much in colour, some being pale yellow, others pale yellowish-green, a few reddish, and others dark brown and brown and green. None answered exactly to Koch's figure of the apterous female, but as those I found varied so much there is little doubt that it is the same species. The same insect was found at Wye in July, 1915, on *Borago officinalis*, and in August, 1889, on *Anchusa officinalis* at Ottery St. Mary, S. Devon.

#### 7. *Aphis callunæ*, nov. sp.

*Apterous viviparous female*.—Black, marked with a fine mealy white hexagonal and polygonal sculpturing, which is most character-

istic under a  $\frac{2}{3}$ -power, appearing as a pruinose mealy coating under a Coddington lens; five pairs of more or less prominent dark lateral spots are present, due to the absence of the mealy sculpturing. Cauda black, prominent, coated with farinose matter. Legs and antennæ black; venter dull greenish-brown with much mealy covering. Cornicles short, thick and black. On immersion in alcohol all the beautiful mealy markings go, and the insect becomes a deep reddish-brown. The antennæ are shorter than the body, the basal segment is wider but scarcely longer than the second, the third is a little longer than the fourth, the fourth about equal to the fifth; the sixth the longest, its flagellum rather more than twice the length of the basal area, the fourth to sixth markedly imbricated, the third less so; sensoria on fifth and sixth normal. The proboscis reaches to the coxæ of the second pair of legs, acuminate, the apical segment twice as long as the penultimate, both dark. Cornicles black, short and rather thick, about the same length as the cauda or slightly longer, imbricated. Cauda black, slightly constricted at the base, spinose, with four pairs of lateral hairs. Anal plate black and spinose. A small papilla on each side of the pronotum, and another just caudad of the hind wings. Abdomen with a few short hairs, some showing slight apical enlargement. Head flattened in front, with two median frontal hairs, slightly capitate. The surface of the body shows more or less clearly hexagonal and polygonal sculpturing answering to the white sculpturing shown when alive. Tibiæ with moderately long hairs.

*Length*, 1 mm.

*Food Plant*.—Heather (*Calluna vulgaris*).

*Locality*.—Brockenhurst, New Forest, August 20th, 1915.

*Observations*.—Described from a single colony found in the flowers and flower-heads of the heather in the New Forest. The young are greenish with black legs and antennæ; a few were pale plum colour. It is a very marked and beautiful species when alive and in the adult apterous stage, which alone was found. It appears to be rare, as I have frequently searched both *Calluna* and the *Ericas* in England and Wales, and this is the only aphid colony I have been able to find. The only record I know of an aphid on Ericaceæ is the species described by Walker from Hardy's MSS. as *Aphis ericæ* (List. Homop. Ins. in Coll. Brit. Mus. part iv. p. 1038, No. 307, 1852). This is a small, grass-green, shining, flask-shaped aphid, convex above, very slightly granulose; legs testaceous; antennæ dusky, longer than the body, the first and second segments greenish, third long, fifth shorter than the fourth. Length  $\frac{3}{4}$  line. Found in Scotland. Clearly quite a distinct insect from the one described here.

#### 8. *Macrosiphum centranthi*, nov. sp.

*Alate viviparous female*.—Head brown; pronotum with a broad brown band; metathoracic lobes brown, and a spot below the base of the wings deep brown, ground-colour of thorax green to deep

yellow-green. Abdomen bright green with three small dark lateral spots before the cornicles and traces of some smaller ones above them. Eyes dark reddish-brown to brown, the two stemmata dark. Antennæ deep brown. Cornicles black, except at the base, where they are green. Legs black, except the basal two-thirds of the femora, which are green. Cauda rather long, acuminate, green. Antennæ longer than the body, basal segment larger than the second, the third very slightly longer than the fourth, with 20-28 sensoria spread over its whole length; fourth longer than the fifth, the latter with normal sub-apical sensoria; sixth not as long as the fourth and fifth. Proboscis reaching to or just beyond the second pair of legs, black at the apex. Cornicles long, thin and cylindrical, about as long as the third antennal segment, the apex markedly reticulate, remainder imbricated; in some specimens the basal one-third of the cornicles may be dark green. Cauda with six long chætæ on one side, five the other, and two curved dorsal apically placed ones. Wings large; stigma yellowish-green; veins darker.

*Length*, 2.5 to 3 mm. *Wing expanse*, 9 to 10 mm.

*Apterous viviparous female*.—Green; the apices of the femora, tibiæ, proboscis and cornicles black, and all the tarsi black. Antennæ long, brown, except the two basal segments, which are green, the fourth to sixth darker than the third; the first segment nearly twice as long and wider than the second; the third longer than the fourth, but not as long as the sixth, with 3-5 sensoria close together near the base; apex darker than remainder; the fourth longer than the fifth; the fifth imbricated, with the usual sub-apical sensorium close to its apex; sixth not quite as long as the fourth and fifth; antennal hairs simple and slightly capitate. Proboscis green, dark at the apex, reaching nearly to or just past the third pair of legs; broad, the last two segments short. Legs long, green, apices of femora with broad black areas; narrower apical dark bands on the tibiæ and black tarsi; femora with a few hairs on each side; tibiæ with many more. Cauda long, about half the length of the cornicles, bluntly acuminate, green, with six pairs of lateral hairs and two median dorsal ones near the apex, the apical one curved towards the tip. Anal plate green. Cornicles long, about as long as the third antennal segment, rather thin and cylindrical, slightly curved outwards, green, black at the apices, or dark brown and black at the apices; the dark area at the apex with large marked reticulations, the remainder faintly imbricated.

*Length*, 2.5 to 3 mm.

*Food Plants*.—Red valerian (*Centranthus rubra*) and common valerian (*Valeriana officinalis*).

*Localities*.—Ramsgate and Margate, May 20th, 1914; Wye, June 30th, 1914; Windermere, June 16th, 1914 (Rymer Roberts).

*Observations*.—I first found this aphid in dense masses on the red valerian on the chalk cliffs at Ramsgate and Margate on May 20th. They were then all apteræ with a few nymphæ. I took home some large colonies, and on the next day some became alate viviparous females, and on the 23rd the alatæ



swarmed. They continued to become alate until the 30th. I transferred many of these alatae to peas (*Pisum*) and bramble (*Rubus*), and they seemed to settle on both, but none of the larvæ produced on both plants lived. It was thought then that this species might be the same as the *M. pisi* of Kaltenbach. It has since proved to be quite distinct. On June 30th I found it at Wye on red and white cultivated valerians (*Centranthus*), when all were apteræ, many being immature. These were watched, and alatae appeared on July 16th. This species is quite distinct from any of the other allied *Macrosiphæ*, now placed in a separate genus by Mordwilko called *Acyrhosiphon* (Faune de la Russie Mus. Zool. Acad. Imp. Sci. de Petrograd Ins. Hemig. vol. i. p. 75. 1914. Petrograd). There is no doubt that *pisi*, *ulmarie*, *gei*, and others with this species should be placed in a distinct genus and separated from *Macrosiphum*, for they present many marked divergent characters from *Macrosiphum rosæ*.

The valerian species is markedly mealy in the larval and nymphal stages, and so are many of the apterous viviparous females.

The young are yellow or pale green. The nymphæ are yellow-green and mealy, with a dark central line; antennæ pale brown, dark on the apical half, and are carried over the body; legs pale brown, except the base of the femora; apex of the tibiæ and tarsi dark; cornicles long, thin, cylindrical, and dusky; eyes black.

(To be continued.)

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## NOTES AND OBSERVATIONS.

INJURY TO THE WINGS OF *LYCÆNA ARION*.—I note Mr. Frohawk's explanation with regard to the damage to the wings of this butterfly commented on in my notes published in the September 'Entomologist' (*antea*, p. 215), but I am convinced that his explanation does not apply in this particular case. For one thing, I am practically certain that the locality referred to is known as an habitat of *L. arion* to extremely few people; and, further, as I spent a considerable amount of time on the spot, I am able to state positively that no dealer had anything to do with the injury to the wings referred to. I find I omitted to mention one very interesting fact in connection with this, which throws rather more light upon the matter. Early one morning I noted a fine female resting on a stem of grass, and, without using my net, merely tapped the grass, causing the butterfly to drop into the killing-bottle without being handled at all. When examining it, however, about half a minute afterwards, I noticed a triangular piece was missing from the edge of the fore wings, and therefore replaced it on the grass, hoping that it would revive. I then made the discovery that the specimen in question had only very recently emerged from the pupa, the wings, although



fully expanded, being quite limp and useless for flight. There is, therefore, no question about the specimen having been captured and released, and in any case it is scarcely likely that a dealer would damage and liberate specimens of a comparatively rare butterfly when searching for varieties, in view of the fact that *L. arion* is little given to variation, and normal specimens, from a dealers point of view, are well worth the taking. Finally, I have a specimen in my collection that well illustrates the particular style of injury, being absolutely perfect with the exception of a triangular piece measuring about 8 mm. each way which is missing from the fore wing between the sixth and eighth veins, the membrane being absent, but the seventh vein being intact, and it was this particular specimen that made me feel inclined to agree with the theory mentioned in my previous letter, that this injury had been caused by ants, either before or while the wings are expanding. I am only acquainted with the Gloucestershire localities of *L. arion*, but I should like to know if the Cornwall specimens exhibit similar injuries.—J. H. GRANT; Cole Dale View, Coleshill Road, Ward End, Birmingham, October 14th, 1915.

ABNORMAL PAIRING OF *ENDROMIS VERSICOLOR*.—Mr. H. Rowland-Brown's note in the 'Entomologist' for October, 1915, on abnormal pairings, recalls an instance which came under my notice when living in London. I happened to have a number of pupæ of *E. versicolor* raised from Culbin ova, and a few of these had emerged, three females and two males, together with a female *Amphidasys strataria*. One of the *versicolor* males shortly paired with a female of its own species, the remaining male buzzing restlessly around the cage. On looking at the insects again an hour or so later, I found the male *E. versicolor* paired with the female *A. strataria*. They remained paired for several hours, and ultimately a large batch of ova resulted, but none of them came to anything.—G. BERTRAM KERSHAW; West Wickham, Kent.

THE RESTING HABIT OF *HIPPARCHIA SEMELE*.—My note on pp. 218-9 has called forth some interesting observations from correspondents, to whom, as to myself, the affection of *H. semele* for flowers was something of a novelty. It is curious to find that in Algeria this unusual experience of the butterfly is constant during a certain period of its emergence in the case of *H. semele algerica*, Obthr. Writing in 'Lépidoptérologie Comparée,' fasc. x. pp. 135-7, Mr. Harold Powell lays special stress upon the flower-loving propensities of the species. "During the month of June," he writes, "the butterfly affects flowers; I observed it principally on thyme and thistle; in the wood clearings and upon uncultivated ground . . . near Sebdoou, in the warm mornings of June, 1907, *semele* was to be seen on the thyme bloom by tens at a time . . . I saw *semele* also in abundance at Djebel-Ksel, near Géryville, and there also thyme was the favourite plant . . . Later in July, August, and September, the flowers being over, the butterfly betook itself to the shade of the green oak scrub, or rested on the trunks . . . It happened more than once that I found this species at my collecting lamp . . . probably disturbed from its rest in the neighbourhood thereof."

M. Oberthür, however, associates it in Brittany with the granite cliffs of the Côte d'Emeraude, flitting over the flowering gorse and heather.—H. ROWLAND-BROWN; Harrow-Weald, October 14th, 1915.

HIPPARCHIA SEMELE AND FLOWERS.—You may hardly think it worth while to add any further notes on the habits of *Hipparchia semele* in relation to flowers, for like most butterflies it appears to vary its practice according to locality. But this summer on the Guernsey cliffs *H. semele* was very abundant, and on large patches of heather and cushions of wild thyme was to be seen resting in numbers, and as actively enjoying the sweets as any other visitors. Had it not been for Mr. Rowland-Brown's experience of its fondness for sea holly—and Messrs. Russell James's and F. W. Frohawk quoting scabious, majoram, centaury and field thistle—I should have said its attentions were, with few exceptions, confined to flowers lying close against the ground. It is, I think, probable that its habits vary less with locality, than with its length of days. It will not often, I believe, visit flowers when it is recently emerged from chrysalis, but as it becomes worn and vitality is lowered, it seeks rejuvenescence from the flowers. Perhaps after pairing, or between the labour of ovipositing, the females thus refresh themselves. Certainly those captures (in my own experience) settled on flowers are often far past their first beauty.—FRANK E. LOWE; Guernsey, October 13th, 1915.

SIREX GIGAS IN GLOUCESTERSHIRE.—A specimen of *Sirex gigas* was captured here on September 4th, on the wall of the house in the early morning.—B. A. CONEY; Pucklechurch, Gloucestershire, October 23rd, 1915.

CUCULLIA LYCHNITIS AND VERBASCI.—Having met with the larvæ of *verbasci* feeding indifferently on various species of *Verbascum* (mullein) and *Scrophularia* (figwort) in sundry places, I was rather puzzled to reconcile some of Mr. Spiller's statements on p. 244. He speaks of a waste piece of land "in most places soft and spongy," by which, I presume, he means boggy or marshy, and "covered with a profusion of the golden-yellow flowers of the food-plants" (italics mine), by which, I presume he refers to several species of mullein. It would be interesting to know which species they were, because the mulleins, as a genus, are characteristic of dry calcareous or gravelly soils, and all our British species have yellow or creamy-yellow flowers. On the other hand, all the figworts have reddish or purple flowers, except one, in which they are yellow, and all, except this one, prefer damp or wet situations. If Mr. Spiller found mulleins growing in boggy or marshy ground it is a botanical observation worth noting. Possibly, though, the plants were growing on dry "islands" amongst the surrounding "soft and spongy" spots; but even this would be worth noting. I myself met with four larvæ of *lychnitis* in Gloucestershire, in July, 1913, and they were feeding on the flowers of water figwort (*Scrophularia aquatica*) along the banks of a stream in a low-lying meadow. All pupated safely and went over two winters, three of them producing nice specimens last

May; the fourth pupa went mouldy. I carefully kept a look-out for the species on the mulleins, *Verbascum thapsus* and *nigrum*, both common on dry downs and hillsides in the district, but saw no *lychnitis*, although *verbasci* occurred on them and also on *Scrophularia*. I had never come across *lychnitis* before.—C. NICHOLSON; 35, The Avenue, Hale End, Chingford.

UNRECORDED OCCURRENCE OF *ANOSIA PLEXIPPUS*; *PIERIS DAPLIDICE* AND *VANESSA ANTIOPA* IN BUCKINGHAMSHIRE.—I am indebted to Mr. William Crouch for the following interesting notes concerning the occurrence in Bucks. of *Anosia plexippus*, *Pieris daplidice*, and *Vanessa antiopa* which, I think, should be placed on record. I may add that this instance of *A. plexippus* brings up the total number to thirty specimens either seen or captured in the British Islands (including one captured in Guernsey by Col. A. H. Collings on October 2nd, 1886), since the appearance of the first recorded example at Neath, S. Wales, on September 6th, 1876. Respecting this species Mr. Crouch states in his letter dated October 14th, 1915: "Having made no note of the date at the time I can only say that it was about 1894. I was having breakfast in the verandah at my old house—Rickfords Hill, Aylesbury—(my son, Capt. L. W. Crouch, now at the front was with me) when this large butterfly flew across the garden within a few yards of us. It could be nothing else than the black-veined brown from its size and colour. The impression it gave us was being like a silver-washed fritillary, only about three or four times as large. My son was then quite a small boy, but neither he nor I have ever forgotten the unaccustomed sight. The garden being very small we had no opportunity of catching it as it did not settle." This is perhaps the most interesting record we have of this butterfly, as it is the only one seen in an inland county, all the other examples occurred in the coast counties, and it is also one of the most northern localities where this species has occurred. *Pieris daplidice*, male, captured by Col. John Day at Stoke Mandeville, Bucks., on August 2nd, 1913, while sketching in a clover field. It is fairly perfect, being a little faded, and is now in Mr. Crouch's cabinet. *Vanessa antiopa*.—A specimen seen on two consecutive days, September 15th and 16th, 1915, by Mr. Crouch and his gardener in his garden at Friarscroft, Aylesbury. It was first observed sitting with expanded wings on a chestnut tree in the sunshine; it then sailed about in a stately manner but did not fly fast. The following day it was seen by the gardener while resting on a row of sweet-peas. It was evidently attracted by some rotten fruit which was lying about in the adjoining orchard.—F. W. FROHAWK; October, 1915.

*PYRAMEIS ATALANTA*, &C., IN THE CHILTERN, 1915.—In my article on the butterflies of the Henley district of the Chilterns (September 'Entomologist,' pp. 208-212) I stated that from the time of arriving at Henley on August 13th till the time of writing, August 26th, I had not seen a single *P. atalanta*. Subsequently, however, a few specimens were noticed. The first occasion was on August 30th, a very windy day, when two were seen. After this I saw them at intervals of two or three days up till my departure on September 20th, but never more than one or two specimens in a day except



once, on September 4th, when about six were observed during a walk of four miles along the summit of the northern Chiltern escarpment. These particulars will serve to show the scarcity of the butterfly in the district this year, a scarcity which seems to have prevailed also in other places. On September 10th I saw a fresh-looking specimen of *P. cardui*, the only one noticed during my stay. *C. argiolus* was observed at intervals up to September 8th.—HUGH SCOTT; Cambridge, September 30th, 1915.

VANESSA ANTIOPA IN SURREY.—It may be of interest to report that a friend of mine (not a collector) residing at Addiscombe, Surrey, had a specimen of *Vanessa antiopa* fly in his window on September 22nd, which he asked me to set for him as a memento.—C. SAVILLE; 16, Mincing Lane, E.C., October 15th, 1915.

COLIAS EDUSA IN 1915.—The only *Colias* I have seen alive this year was a specimen of *C. edusa*, which I think was a female, on Southsea Common, September 25th. The appearance of this species in some numbers in the Portsmouth district during August has been noted elsewhere.—HUGH SCOTT.

COLIAS EDUSA IN SUSSEX.—Whilst driving from Arundel on September 8th last, Mr. J. C. Kershaw and I observed a male *C. edusa* flitting amongst the flowers by the roadside; it appeared to be in perfect condition.—G. BERTRAM KERSHAW.

COLIAS EDUSA IN HAMPSHIRE.—On August 19th a male specimen of *C. edusa* was seen on the cliffs at Milford-on-Sea.—A. S. CORBET.

COLIAS EDUSA IN CORNWALL.—I saw no *C. edusa* this year in Cornwall, and, if I remember rightly, I saw none last year, though during the ten years or more I have been going to West Cornwall, I have seen them, I believe, *every* year up till 1914. They usually appeared at the end of September, and I have more than once seen more of them in October than in September. Their non-appearance this year had nothing to do with weather, which was of the best. *P. cardui* was common. But nothing in the way of butterflies this season has struck me so much as the large number of *C. argiolus*. I have seen them commonly, both early and late broods, nearly everywhere I have been, including our own garden at Highbury; though, of course, they were not numerous there.—HAROLD HODGE; October 13th, 1915.

DRAGONFLIES BRED IN 1915.—I have bred this year *Cordulegaster annulatus* (one male, nymph taken in New Forest), *Æschna grandis* (nymphs from Byfleet), *Æ. cyanea* (nymphs taken at Corfe Castle), *Libellula depressa* (nymphs from Corfe Castle), *Pyrrosoma nymphula* (nymphs from Angarrack, Cornwall), *Agrion puella* (nymphs from Byfleet), *Calopteryx splendens* (nymphs, I believe, from Richmond, Surrey; but I am not certain, as they were not taken by myself). From my experience this has been a late year with dragonflies. The nymphs of nearly every species I had were late in emergence. *L. depressa* began to come out in July or the last day or two in June; one emerging on July 31st. Latest of all, a *Sympetrum*



*striolatum* came out on October 5th; this, however, may have been a case of prematurity rather than delay. The nymph was one of a number I had just got from Angarrack marshes in Cornwall, and the general excitement of the violent disturbance may have brought about emergence. At any rate, I have noticed that very often when nymphs have just been caught and removed to new quarters, one or more of them emerge at once, no others coming out until after a considerable interval of time. I think the general lateness this year was largely due to the coolness of the summer. A hot spell usually brings out many dragonflies; while nymphs apparently fully mature and showing the usual signs of contemplated emergence will not come out on a cold day; protracted coolness causing some of them to give up the attempt for the whole season, sometimes apparently with fatal results.—HAROLD HODGE; October 1st, 1915.

ZYGÆNA FILIPENDULÆ AND MACROTHYLACIA RUBI ON THE HAYLE ESTUARY.—There is an entomological phenomenon about the Hayle Estuary, in Cornwall, which seems worth recording. At low tide the estuary is certainly not more than three hundred yards wide in parts, and divides an absolutely homogeneous terrain. Yet on one, the Lelant, side the cocoons of *Zygæna filipendulæ* are to be found in thousands; on the other, the Hayle, side hardly one is to be seen. I have visited this part in the autumn, staying some four or five weeks, for now many years following, and I have not found more than three *Z. filipendulæ* cocoons on the Hayle side. In exactly the same case are the larvæ of *M. rubi*, swarming on the Lelant side, not seen on the Hayle towans on the other side. The phenomenon is constant year after year.—HAROLD HODGE; 9, Highbury Place, London, N.

THECLA ÆSCULI IN THE SOUTH OF FRANCE: ERRATA.—Page 240, for "♂" read "to." Page 241, line 2 from top, there should be a comma after lighter; line 5 from top, after "lighter" insert "than"; and line 6 from top, after "diminishing" insert "much"; line 18 from top, for "dark" read "light brown." I much regret these errors, probably due to my inaccurate transcription of the MS. notes so kindly placed with me by Dr. Rosa.—H. R.-B.

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## SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—August 26th.—Mr. A. E. Tonge, F.E.S., Vice-President, in the chair.—Mr. Main exhibited leaves of the sycamore in which were the larvæ of the Sawfly *Phyllotoma aceris*, and leaves of alder in which another species of *Phyllotoma* fed in a somewhat similar manner. Mr. Edwards, butterflies from S. America of the genera *Cybdelis*, *Cyclogramma*, *Cotenephile*, and *Myrcelia*, showing marked seasonal dimorphism.—Mr. Newman, a "blue" captured in Kent in July, which, from its colour and markings, he considered a hybrid between *Agriades coridon* and *A. adonis*.—Mr. Bunnett, bunches of the ova of the lace-wing *Chrysopa flava*, each laid on a separate

stalk.—Mr. C. B. Williams, a box of Lepidoptera he had met with in the Italian Val Formazza, from Domodossola leading up to the Tosa Falls.—Mr. Ashdown, two aberrations of *Coccinella bipunctata*, in which the spots were enlarged and united in a very unusual manner.—Mr. West (Greenwich), a rare Coleopteron, *Scymnus arcuatus*, presented to the Society's collections by Rev. J. T. Perry.—Mr. Sperring, extremely dark examples of *Boarmia gemmaria* (*rhomboidaria*), bred from ova, the female parent from Darenth.—Mr. Tonge, confluent examples of *Anthrocera filipendulæ* from Reigate.—Mr. B. S. Williams, on behalf of Mr. Wanhill, a *Gonepteryx rhamni*, in which male and female colour were mixed on the fore wings, and several melanic specimens of *Hibernia defoliaria* from Epping Forest.—Mr. Bowman, a very fine series of *H. defoliaria* from Epping Forest, including a dozen melanic examples, several light forms, strongly banded forms, mottled forms, &c. In nine years previous to 1914 he had only met with two melanic forms in this locality.

September 9th.—Mr. A. E. Gibbs, F.L.S., F.E.S., Vice-President, in the chair.—Mr. Sano exhibited living larvæ, pupæ, and imagines of the Longicorn Coleopteron, *Rhagium inquisitor*.—Mr. Leeds, under side aberrations of *Agriades coridon*, ab. *semisyngrapha*, blue suffused females of *Polyommatus icarus*, and an ab. *syngrapha* with very dark margins to the wings.—Mr. H. Moore, imagines of the *pylades* group of *Papilio* from Africa, and read notes.—Mr. West (Greenwich), the rare Coleopteron *Athous rhombus* taken at Ascot during the field-meeting on July 3rd.—Mr. B. S. Williams, an aberration of *Eupithecia subnotata* in which the mottled markings were absent, there being present on the sub-marginal area a series of quadrate light spots.

September 23rd.—Mr. A. E. Gibbs, F.L.S., F.E.S., Vice-President, in the chair.—An evening for the exhibition of lantern-slides.—Mr. Tonge exhibited some beautiful slides illustrating the resting attitudes of the imagines of several Lepidoptera.—Mr. Colthrup, the attitudes of living larvæ of several Lepidoptera.—Mr. Hugh Main, coloured slides of botanical and entomological subjects.—Mr. Tonge exhibited a series of *Boarmia repandata* reared from Norfolk ova, the *repandata*-form ♂ = 1, ♀ s = 29, and *conservaria*-form ♂ = 0, ♀ s = 39. He also showed a series of *Numeria pulveraria* reared from Abbot's Wood ova; the variation was practically nil—♂ s = 24, ♀ s = 27.—Mr. B. S. Williams, an aberration of *Crocallis elinguaris* in which the ground was heavily dotted with dark brown and the central band sharply margined white.—Mr. Morford, the case of the Psychid *Pachythelia villosella* from the New Forest.—Mr. Buckstone, a bred series of *Lithosia deplana* from Mickleham, one example being very smoky with rich yellow costa and fringes.—Mr. Priske, the large galls in the stems of thistles.—Mr. Leeds, many aberrations of "blues" taken this season mainly in Herts, with an *Epinephele jurtina* having extra ocelli on both upper and lower side, and an *Agriades coridon* ab. *semisyngrapha* from Kent.—HY. J. TURNER, Hon. Rep. Sec.

## RECENT LITERATURE.

*Some South Indian Insects and Other Animals of Importance Considered Especially from an Economic Point of View.* By T. BAINBRIGGE FLETCHER, R.N., F.L.S., &c., Imperial Entomologist to the Government of India. Pp. i-xxii, 1-565. Madras: Printed by the Superintendent, Government Press. 1914. Price 6 rupees (9 shillings).

THE first part of this excellent work is divided up into twenty-three chapters, and of these the first nine are devoted to more or less brief consideration of the following subjects: Definition and Structure of Insects, Classification and Nomenclature, Metamorphosis, Means of Defence in Insects, Communication amongst Insects, Tropisms, Insects and Plants, Symbiosis and Parasitism, the Balance of Life. In the limited space allotted to each of these chapters the author has skillfully marshalled most, or perhaps all, the more telling facts connected with the matter dealt with. Chapters x. and xi. treat of insect pests and the control of insect pests of crops. The author then proceeds to deal with the various kinds of insects and their depredation on growing crops or stored products. Insect pests of the household are also considered, and a chapter is devoted to insects and disease. Not all insects are inimical to man, however; some, indeed, are really helpful in various ways. This side of the subject is duly noted and adequately treated in a chapter headed "Beneficial and Useful Insects." In the main portion of the book (pp. 264-546) the more important species are duly classified, and details are furnished in the matters of synonymy, life-history, distribution, &c. We consider that this part of the work has been admirably arranged.

Although the author states in his preface that the volume has "no pretensions to the assumption of any status as a text book," we feel assured that it will be accepted as such, especially as regards South Indian insects. From the economic point of view, the work will be of first class importance.

It only remains for us to add that the illustrations are excellent and very numerous. The coloured plates, forty-nine in number, are beautifully reproduced from original drawings. Although many of these plates have appeared in other publications, their inclusion in the present volume will enhance its value.

*Insects and Man.* By C. A. EALAND, M.A. Pp. 343. London: Grant Richards. 1915. Price 12s. net.

IN dealing with this important subject the author has brought together in handy form all, or nearly all, that really matters in connection with each phase under the following headings: Insects and Plants (pp. 33-87); Insects and Human Disease (pp. 88-159); Insect Enemies of Live-Stock (pp. 160-196); Beneficial Insects (pp. 197-233); Household Insects (pp. 234-273); Some Human Parasites (pp. 274-294); Insect Control (pp. 295-322).

In the introduction (pp. 17-32) the progress and present position of applied biology is reviewed, and the various orders of the Insecta briefly discussed.



There is a bibliography and a useful index.

The book is exceedingly well illustrated, as in addition to sixteen plates there are one hundred figures in the text.

## OBITUARY.

JEAN HENRI FABRE.  
Born 1823. Died 1915.

THE announcement of the death in October of Jean Henri Fabre at the ripe age of ninety-two will have awakened emotions of regret in the hearts of many Englishmen and Frenchmen, besides those of all nations who are also entomologists. Fabre was one of the grand old men of France. His name will ever be linked by me with that of another of her grand old men, Mistral, the supreme poet-historian of Provençal humanity, just as Fabre described the insect fairyland of that delectable country. They were life-long neighbours, well-known to one another, and friends, and both brought up under the same blue sky of the Midi, though Fabre was actually native-born of Sainte Leone in Aveyron. He received his first schooling at Vaucluse, in the land of Petrarch, and proceeded thence to the management of the primary school of Carpentras beneath the shadow of Mt. Ventoux—Mistral's own town—or ever Avignon and Arles claimed him for their own to join that wonderful band of troubadours, the *Félibre*, who restored the *langue d'oc* to its rightful place in literature. And just as the Pleiads of Provence starved body and back to possess themselves of the wherewithal to study the poets beyond their ken, so Fabre would sacrifice a whole month of his meagre £40 a year to purchase a first text-book on entomology. It was not until he had passed his thirtieth year, however, that he proclaimed himself Master of Arts in the great "*Ecole buissonnière*" of Nature, where we, too, have been privileged to sit as humble pupils. His first published work, I believe, is to be found in the '*Annales des Science Naturelles*,' 1855-58; and this later was extended in the '*Souvenirs Entomologiques*,' continued from 1879 onwards to 1907. His first published volume is a '*Faune Avignonnaise*,' apparently interrupted by the war of 1870, and stopped with the first fascicule, "*Insectes. Coleoptères*."

Essentially an observer rather than a collector, he found ample material to last a long life in the insects of all Orders occurring within a modest radius of Sérignan—that land of red earth and slanting olive orchards where the cicadas chirped their secrets to his ears—"the roadside nightingale of the nymphs, who at mid-day talks shrilly in the hills and the shady dells"—as to the other but unknown poet who sang of them in Attica two thousand years ago.

Fabre's works occupy no great space upon our bookshelves. "Infinite riches in a little room," they have revealed the conscious life of the insect to thousands who a generation since, perhaps, grudged admiration for the loveliest butterfly, and regarded the field-naturalist as a harmless, unintelligible lunatic. His essays, the epic of entomology, have been translated into many languages, and it is some consolation to reflect that in very old age he was relieved of financial anxieties by an appreciative public at home and abroad, as well as by a grateful country.



A naturalist of the old school, his writing has little in common with that of the pioneers in the then newly exploited realm of research invaded by Darwin, Bates, and Wallace. With the problems of evolution, the meaning of mimicry and such like he was wholly unsympathetic. The theories and speculations of the museum and the laboratory interested him not at all; the labour of his love was pursued in the field where he searched out the lives of the little people of earth and air with the eternal patience of Genius.

It is instructive as a commentary on the retiring nature of the greatest French naturalist of the nineteenth century that his merits were only borne in upon the world at large towards the close of his career. He was not elected an honorary member of the Entomological Society of France until 1894, when he was past seventy; ten years later the Society of London honoured itself by placing the name of Jean Henri Fabre among the twelve Internationals who head the list of Fellows. In 1912 the French Government made him a grant of £400, *honoris causâ*, following the subscription raised in 1910 by his admirers, and the issue of the charming medal designed to his memory which bears a faithful portrait of the Poet of Science.

The ten volumes of the 'Souvenirs Entomologiques' (Ch. Delagrave, Paris) contain two hundred and nineteen studies of insects generally; only a few papers are devoted to Lepidoptera; among them "La Processionnaire du Pin" (6<sup>me</sup> sér., xviii-xxiii), "La Grand Paon" (7<sup>me</sup> sér., xxiii), and "Le Cossus" (10<sup>me</sup> sér., vi). "La Vie des Insectes" consists of selections from the same work. Besides which have been issued a number of his lectures on different branches of science, chiefly entomology and botany (first published in separate form in 1873); and the causeries on similar subjects for young people, delivered by him as "Uncle Paul."

Of these several works I cannot do better than quote the eulogy conferred on them by Mr. Paul Thureau-Dangin on the occasion when the Académie Française awarded the Prix Née to the author:—"Lisez ces récits, vous en goûterez le charme, la bonhomie, la simplicité, la vie, vous vous passionnerez à cette science aimable qui se fait au jour le jour, dans les belles heures d'été 'au chant des cigales,' à cette science qui n'a rien de germanique, oh non! qui est bien latine, virgilienne par moments, qui donne la main à la poésie, qui est, enfin, si pénétrée d'amour qu'il semble, parfois, que de ces humbles souvenirs entomologiques, s'élève une strophe du Cantique des Créatures."

A biography entitled 'J. H. Fabre, Naturaliste,' by J. V. Legros, Paris, appeared in 1913, and apparently a translation of the same work entitled 'J. H. Fabre, Poet of Science,' 1913. The principal English editions of his works are 'Insect Life,' translated by Margaret Roberts, edited by F. Merrifield (Macmillan & Co., 1901); 'The Life and Love of the Insect,' translated by A. Teixeira de Mattos (A. & C. Black, 1911); 'The Works of J. H. Fabre,' translated by A. Teixeira de Mattos, with preface by Maurice Maeterlinck (Hodder & Stoughton, 1912), in progress; 'Social Life in the Insect World,' translated by Bernard Miall (T. Fisher Unwin, 1912).

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## SOME CONIOPTERYGIDÆ IN THE NORTH, WITH A DESCRIPTION OF A SPECIES NEW TO THE BRITISH ISLES.

By J. W. H. HARRISON, B.Sc.

I HAVE spent a considerable amount of time during the past few years in the investigation of the more obscure groups of our local flora and fauna, with very successful results. Amongst the species taken is a Neuropteran, *Conwentzia pineticola* (Enderlein), allied to, but very distinct from, the common *C. psociformis* (Curtis); this species of Enderlein's is new to the British list.

I first took this insect from larches, between Ormeby and Nunthorpe stations, badly victimised by *Chermis laricis*; subsequently I procured the insects with hosts of *Coniopteryx tineiformis* (Curtis) from silver fir (*Abies pectinata*). In both cases the insect occurred in considerable numbers and, what is specially noteworthy, without a single *Conwentzia psociformis*. Further work in similar localities, both in North-east Yorkshire and South-west Durham, has proved the insect to be widespread with us, and to have a range of altitude from sea-level to nearly 1200 ft.

In Lonsdale, in Cleveland, at a height of 800 ft., the insect was beaten from larch in a mixed alder and larch wood in company with *C. psociformis*. From holly and many deciduous trees, on the outskirts of the same wood, only *C. psociformis* was obtained, but in large numbers.

*Coniopteryx tineiformis* is very common throughout our area in the lowlands, but thins out as one ascends. I have taken it from elm at sea-level at Greatham, South Durham, and likewise at a height of 800 ft. from birch and alder on Esler Nab and in Lonsdale (both in Cleveland), and even at a height approaching 1200 ft. near Wolsingham, in Durham, from oak. In the intervening tracts it occurs on many trees in greater or less abundance.

*Semidalis aleurodiformis* (Stephens) is everywhere rare here,

having been beaten only once, and that from honeysuckle near Gunnergate, in Cleveland.

*Conwentzia psociformis* is more or less common everywhere, especially on holly, ivy, and honeysuckle.

A very brief note of the capture of this new form has appeared in the 'Vasculum,' the local Natural History Magazine for Durham, Northumberland and the adjacent areas, but no description was appended. The deficiency is now remedied.

*Conwentzia pineticola* (Enderlein).

Head and thorax pitchy brown; collar and under side of thorax much paler; thorax with three white spots forming an inverted isosceles triangle. Antennæ 32 jointed; legs and antennæ fuscous in colour. Abdomen yellowish, more or less regularly mixed with brownish red. Wings, in life, snowy, but preserved in spirit, smoky, clearer just above the median vein. The subcostal nerve, the radius, and cubitus 1 are very dark and heavy, and the ground area near them slightly darker. The other veins dark, but not black, with the exception of the two outer transverse nervules which are almost colourless. The neurulation and depth of colouration of the wings are very variable, and may be different in the two sides of the same insect; it is therefore clear that differences in neurulation, such as have been used to separate this species from *C. psociformis*, are of but little use. Nevertheless the two insects cannot be confused, even without the examination of the genitalia, if one considers the colours of the abdomen of the two; I have never seen a *C. pineticola* without the reddish colouration or a *C. psociformis* with it.

*Habitats*.—Throughout N. Cleveland, Upper Teesdale, Durham.

## NOTES ON NEW AND LITTLE KNOWN BRITISH APHIDES.

BY FRED V. THEOBALD, M.A., F.E.S., &c.

(Continued from p. 263.)

In 1903 Clarke described a *Macrosiphum valerianæ* in California (Canad. Entom. xxxv. p. 253). I at first considered that the British species was the same, but as Clarke describes the apterous viviparous female as being yellow-brown and with black nectaries, and the general colour of the abdomen of the alate female as yellow-brown, I have described the insects I have found as a distinct species. I should not be surprised, however, if they proved to be the same, a point which can only be decided by a comparison of American and British specimens.

Schoutenden (Ann. Soc. Ent. Belg. 47, p. 190, 1903) records *Aphis viburni*, Scopoli, from *Valeriana officinalis*. Tavares (Brotéria, S. Fiel. vi. Le Zool. p. 113) a black Aphid from *Centranthus calcitrapa*, Lichtenstein (Les Pucerons, p. 131) records *Siphonophora rosæ*, Linn., and *Aphis papaveris*, Fabr., from *Centranthus*, and the former from *Valeriana* (p. 140). I assume these apply to the new species described here and to *Aphis rumicis* which is common on both plants.

9. *Macrosiphum lamii*, nov. sp.

*Alate viviparous female*.—Head and thorax yellowish-green to yellow; thorax with brownish lobes. Abdomen bright green in front, yellow to orange posteriorly; with rather indistinct darker green lateral spots. Venter green; mesosternal plates pale brown. Antennæ longer than the body, dark brown; base of third segment pale. Cornicles pale, dark at the apex. Legs fawn-coloured, apex of the femora, tibiæ and tarsi, black. Wings with dark brown veins and stigma.

Antennæ arising from prominent frontal processes, two basal segments pale, the first longer than the second; the third longer than the fourth, with 13–16 sensoria, more or less in a straight line, and more or less extending to the apex of the segment; fourth segment longer than the fifth; sixth not as long as the fourth and fifth. Proboscis reaching to the second pair of legs, green; apex black, rather thick. Cornicles narrow, cylindrical, shorter than the third antennal segment, with one or two laterally branched transverse striæ at the apex, rest imbricated. Cauda green, prominent, with three pairs of lateral hairs and one median dorsal one near the apex, less than one-third the length of the cornicles. Length, 2 mm.; wing expanse, 9 mm.

*Food Plant*.—The red lamium (*Lamium purpureum*).

*Locality*.—Wye, Kent (June 8th, 1914).

*Observations*.—Described from some alate viviparous females which were found producing their young in isolated colonies. The larvæ varied from pale to deep green. No apterous viviparous females could be found. They were found amongst the flowers and under the leaves.

10. *Kaltenbachiella menthæ*, Schouteden (Mém. d. l. Soc. Ent. Belg. xii. p. 195, 1906).—This root-feeding aphid, described by Schouteden from the terminal roots of corn mint (*Mentha arvensis*), was sent me by Mr. J. C. F. Fryer, of the Board of Agriculture, on the roots of water mint (*M. aquatica*) from Chateris, Cambridgeshire, on September 15th, 1914. All the specimens were apterous females, but one which just showed traces of wing-buds; unfortunately this died. These insects produced much flocculent white wool on the roots, often in little compact patches. It clearly bears strong resemblances to Passerini's *Rhizobius menthæ*. I have this water mint colony still alive, but no alatae have occurred at present.

## SOME NOTES ON THE PAPILIONIDS.

BY CECIL FLOERSHEIM, F.E.S.

(Continued from p. 258.)

(9) *Papilio alcinous*.—An account of my experience with this species should have preceded the notice of *P. bianor* in the last number of the 'Entomologist.' It was for reasons of space only that it was omitted. *P. alcinous* is a native of Japan and



other parts of Eastern Asia, and is one of the Pharmacophagous or *Aristolochia*-feeding Papilionids, a branch of the family which, as has been stated in a former note, *Laertias philenor* represents in North America. I bred it successfully, both in my butterfly-house and out-of-doors in the summers of 1913 and 1914. But in point of adaptability to its English environment, it is far from proving as accomodating as its Nearctic congener. In my butterfly-house, though I had a considerable number of fertilized females on the wing, it oviposited sparingly; out-of-doors, under natural conditions, it did so freely enough. In both circumstances, however, not only did the larvæ feed up very slowly, but the resulting pupæ all gave rise to a second brood in the early autumn. The newly-formed pupæ, unlike those of *L. philenor*, I found to be exposed to the attacks of earwigs, which in many cases devoured them and left only their shell, and in several instances I bred a large member of the Ichneumonidæ, closely resembling *Trogus exesorius*, from the pupæ which I received from Japan. I found, however, that my *alcinous* pupæ were not subject to the ravages of the small black fly which infests my butterfly-house. I am unable to explain why my *alcinous*, which fed upon the same plants of *Aristolochia siphon* as my *philenor*, did not enjoy an equal immunity. It has been stated by Leech, who quotes Pryer, in his 'Butterflies of Japan and Corea,' and by Seitz in his 'Macro-Lepidoptera of the World,' that the larva of *alcinous* feeds upon *Cocculus Thunbergii* (natural order Menispermaceæ); though I had a number of plants of this creeper growing both in my butterfly-house and out-of-doors, I never found the ova or larvæ of *alcinous* on them. *A. siphon* was without exception the food-plant chosen, the imagines, as if they wished to accentuate the fact that they were true *Aristolochia*-feeders, haunting the large *Aristolochia* plants in my kitchen garden for days at a time, sunning themselves upon the broad leaves and returning to them if driven away almost invariably. Mr. Green, who came over from Camberley a few months ago to see my butterfly-house, gave me the probable explanation of this. It appears that *A. Indica*, a common Eastern member of Aristolochiaceæ, greatly resembles both in habit of growth and in leaf *C. Thunbergii*. Hence the mistake probably has arisen. In its like-habits this butterfly presents some points of difference from *L. philenor*. The ovum, which is like that of the latter species in colour, being of a brownish red, is laid singly, instead of in batches, upon the fully expanded leaves, not the stems or budding leaves of the food-plants. The larva is solitary, not gregarious, and is as sluggish in habit as that of *philenor* is active. It clings to the under side of the largest *Aristolochia* leaves, and moves as little as is compatible with feeding. It is a striking-looking object when fully grown, brownish black, with scarlet and white

fleshy filaments, the latter taking the place of the white saddle-marking, which, unlike *L. philenor*, it possesses in its earlier stages. It is exceedingly short and thick-set, and looks like a small porcupine with its quills erect rather than the ripe mulberry to which Seitz compares it. The pupa, which is fluted and curved like the scroll of a violin, is of a clear light brown in colour, and both in size and shape resembles that of *Papilio hector*. It reminds me, in miniature, of drawings I have seen of the pupæ of some of the Malayan Ornithoptera. The imago, unlike that of *L. philenor*, seems to feed seldom on flowers, but spends most of its time, particularly in the case of the females, in fluttering in and out of the *Aristolochia* leaves, or sunning itself upon them. It is, however, long-lived, and in the fine early summer of 1914 individuals would haunt my *Aristolochia* plants for weeks together.

(10) *Papilio xuthus*.—I have found this butterfly, which is said to be the commonest of all the Papilionids in Eastern Asia, extremely easy to rear in my butterfly-house. It is, however, seasonally dimorphic, and probably under natural conditions, even in the South of England, would be almost entirely double-brooded. In the summer and autumn of 1913 I managed to get some sixty pupæ of the first brood to go over the winter without emerging, by keeping them until late in November on ice in a refrigerator. In 1914, when I neglected to take this precaution, all my pupæ disclosed imagines of the summer or *xuthus* type in August and September, and I lost my stock. I may remark, in confirmation of the experiments of other entomologists, that the delayed pupæ of 1913, which would no doubt have disclosed imagines of the normal summer kind had their development not been arrested, gave rise only to individuals of the *xuthulus* or spring form in 1914. Some of these were larger than is usual with *xuthulus*. It was, however, only the medium-sized and smaller summer pupæ with which I was successful. The largest pupæ all either gave rise to imagines in the autumn or died during the winter.

Though the earlier stages of this species have long been familiar to entomologists and I need not describe them in length, a few remarks on its life-habits may not be superfluous. In food-habit, as far as I have been able to observe, it is confined to the Rutaceæ. In my butterfly-house *Aegle sepiaria* (*Citrus trifoliata*), for which I should say the imago shows a slight preference, and *Skimmia* were the plants chosen, and out-of-doors I have found the larva on *Skimmia*, *Dictamnus*, *Phellodendron*, and *Aegle*. I also fed up some of the larvæ in a cool greenhouse on shaddock, *Citrus decumana*, but the resulting pupæ and imagines were decidedly smaller than those reared upon other plants mentioned, and the larvæ fed up slowly as if the food was not altogether to their liking.

The ovum is laid singly, sometimes on the upper side, but more frequently on the under side of a leaf of the new growth, the topmost side-shoots of *Aegle* and *Skimmia* being often chosen for this purpose. The larva feeds fully exposed in the sunlight, and is remarkably difficult to detect when full-grown. Its general protective scheme of leaf green, with lateral stripes of lilac-grey edged with white to imitate the effect of sunlight falling on leaves, is strikingly like that of our own *Sphinx ligustri*. In most instances it pupates either on the food-plant itself or at a short distance from it. The pupæ of the green variety I have often found in most exposed positions on the topmost shoots, and so difficult are they to tell from their surroundings, that I have sometimes looked at them for days without finding them, discovery at length resulting from the darkening in colour prior to the emergence of the imago, or even only when the empty brown shell had been abandoned. Of course I am speaking of the pupæ of the first brood, which would normally give rise to *xuthus*. I have never yet seen those of the second under natural conditions. In conclusion, I may remark that I do not think it at all likely that *xuthus* would ever be able to establish itself in the British Isles, though, like so many other of the species with which I have dealt in these notes, it could probably be easily introduced into Southern Europe in localities where a sufficiency of plants of the Rue family, with the possible exception of the Aurantiaceæ, to which it does not seem addicted, were grown.

(11) *Papilio hippocratis*—This butterfly is a native of Japan. It closely resembles our own *P. machaon* particularly in its early stages, and has been treated by the text-books as a variety of that species. While, however, I feel that I am not competent to express any decided opinion on the subject, I should venture to doubt whether the differences between them are merely those of a varietal nature.

I have always found *machaon*, var. *britannicus*, to interbreed freely enough with any of the Continental races of the species. But though I have had the imagines of *hippocratides*, the spring brood of *hippocrates*, out in my butterfly-house at the same time as those of *machaon*, both in 1912 and in 1914, on neither occasion did I notice any pairings between them. In the former season I had been able to procure very few pupæ of *hippocratides* from Japan, and the imagines which emerged were all males. I did not see any of these in copûla with *machaon*, of which both sexes were present in abundance. Neither did any trace of *hippocrates* reveal itself in the *machaon* which I bred that season. I must, however, point out that owing to the abnormal cold and wet of the late summer of 1912, I succeeded in rearing very few *machaon*. In 1914 I was able to procure a fairly large number of *hippocratides* pupæ, and at one



time during that season I must have had at least forty of the imagines of both sexes out in my butterfly-house with about double that quantity of *machaon*. I did not notice any cross-pairing, each confining itself to its own kind in so far as I was able to observe. It is only fair to remark here that a large proportion of the pairing which takes place in my butterfly-house are not witnessed by me, partly because they often occur low down amongst the herbage or in similar places where the insects are difficult to detect, partly because I myself am frequently away. Perhaps a comparative examination of the genitalia of *hippocratides* and *hippocrates*, with those of the spring and partial summer broods of *machaon*, would throw light on the matter.

In any case, *hippocrates* would, I fear, be totally unsuited for introduction into this country, for it is seasonably dimorphic, and even in the not particularly warm summer of 1914, proved to be entirely double-brooded. I have seen it stated that it is only in the third brood of *hippocrates* that the largest specimens of the dark female variety occur. Naturally enough, I was unable to test this for myself in our northern latitudes, but two of my female *hippocrates* which were among the first to emerge at the end of July measured more than five inches across the wings. With the larva of *hippocratides* I am not acquainted. The pupa differs both in shape and in colour from that of our English *machaon*, but not more so than many pupæ which I have received from the Continent. The larva of *hippocrates* is indistinguishable from that of *machaon* except in respect of size. The pupa of *hippocrates*, though of course much larger than any *machaon* I have ever seen, seemed to be identical with that of *machaon* var. *britannicus* in shape. The few specimens I found of the brown variety of the pupa resembled those of our English variety far more than did the *hippocratides* both in colour and in markings; while the far more numerous individuals of the green variety appeared to be similar in both respects to those of the small partial second brood of *machaon*. I have always found those, which are also usually of the green variety, to differ in a marked degree in colour and slightly also in shape from the pupæ which hibernate. Both the green and buff are more vivid, and the projections on the dorsal parts of the abdominal segments slightly more raised.

(12) *Iphiclides podalirius*.—In regard to this Papilionid I have little to say. On several occasions I have had the imagines out in my butterfly-house; but they clung obstinately to the sides of their prison and refused to fly, feed, pair, or indulge in any other of the normal processes of butterfly life. In consequence, after a few days I have always given them their liberty, and have had the pleasure of seeing them float away in apparent enjoyment of the upper air.

Though, as I have said before, my experiments in hybridiza-



tion have proved on the whole a failure, the breeding and observation of the species of exotic Papilionidæ described in the foregoing notes have been of great interest to me, and I hope that time will enable me to extend what I feel to be a limited and superficial knowledge of the life-habits of this family. Various attractive by-paths, too, have presented themselves, exemplifying the paradox that the more men know the more ignorant they become. Since each fact which the human mind adds to its slender store increases in ever-growing proportion the number of those which it becomes possible for it to learn. The subject of the food-habit of the group in itself opens a long, if not endless, vista for research. For instance, to touch on one small matter, why should the *Aristolochia*-feeding habit, which seems to confer complete immunity from parasitic attack on the larva and pupa of *Laertias philenor*, only protect to so small an extent those of *Papilio alcinous*? Or to take quite another line of investigation, is the remarkable general likeness which exists between the full-grown larvæ of *Jasoniades glaucus*, *Euphocades troilus*, *Papilio xuthus*, and *Papilio bianor* due to the fact that these species are closely allied, or is it merely a similar means of protection evolved by the organism in a similar environment? As an example of the latter, I would instance the case of the partly-grown larva of *Hyloicus pinastri*, which, when it is of the same size as the full-grown larva of *Panolis piniperda*, presents so striking a likeness to it that it would be difficult to tell the two apart were it not for the presence of the anal horn in the Sphingid.

Yet the pleasure which I have derived from observing and experimenting with my Papilios has been equalled, if not surpassed, by that which I have taken in watching the liberated imagines flying about my garden—quam familiariter—sights such as an apparently endless succession of *bianor* chasing one another over a high hedge of *Escallonia macrantha* one fine summer morning, or of some thirty *philenor* feeding simultaneously with quivering wings at a patch of the still bluer flowers of *Anchusa* var. *Dropmore*, will not soon be forgotten by me. If by giving their freedom to those beautiful creatures I have raised false hopes in the breasts of some brother entomologists, I wish to tender them a formal apology. But I am inwardly impenitent. For I look forward to the time when man who has done so much to beautify his life by surrounding his habitations with the flowers of other countries than his own, will do so to a lesser extent by introducing various exotic kinds of the Lepidoptera, which, in the past of this planet, played so important a part in the development of the flowers themselves; perhaps improving and adapting insect life to his purpose by means of artificial selection, as he is beginning to do with plant life.

When, in far generations to come, this shall happen, I am sure that he will find no butterflies more suited to his ends than the Papilionidæ, both for their beauty and their specialization in food-habit. For anyhow, as far as Europe is concerned, it is only in the South, where the orange and lemon are grown for commercial purposes, that any of the crops and fruits in which man finds sustenance would be exposed to damage from the *Aristolochia* and Rue-feeding branches of the family.

## NEW SPECIES OF GEOMETRIDÆ FROM FORMOSA.

By A. E. WILEMAN, F.E.S.

*Caberodes costipicta*, sp. n.

♀. Head and thorax pale brown, darker mixed; abdomen greyish brown. Fore wings pale brown, sprinkled and flecked with darker brown, costa reddish brown; two oblique blackish streaks on the costa represent antemedial and postmedial lines; discoidal dot dusky, terminal lines black; fringes blackish, becoming greyish towards apex. Hind wings whitish suffused with fuscous brown towards termen and on dorsal area; discoidal dot dusky. Under side whitish flecked with brown, chiefly towards margins; all the wings have a black discoidal dot, and the hind wings have an interrupted brownish postmedial line.

Expanse, 32 millim.

Collection number, 1812.

Three female specimens; one from Arizan (7300 ft.), March, 1908, the others from Rantaizan, May, 1909.

Near *C. paralba*, Swinhoe.*Boarmia fulvipicta*, sp. n.

♂. Head and thorax dark brown, front of thorax greyish tinged; abdomen pale brown mixed with black-brown, chiefly on the posterior edges of segments. Fore wings grey, striated with darker; costa, red-brown, veins marked with black; base red-brown striated with dark grey; antemedial line black, inwardly oblique, wavy and bent outwards below costa; postmedial line black, wavy and incurved from costa to vein 6, thence inwardly oblique to just below vein 2, where it turns in to the dorsum; the black vein marks on this line are very distinct; area beyond postmedial clouded with red-brown; subterminal line pale, wavy, traversing the red-brown clouds; terminal line black, interrupted; fringes dark grey, chequered with red-brown. Hind wings grey striated with darker; discoidal mark and transverse shade blackish; postmedial line black, serrated, outwardly pale edged, area beyond line clouded with red-brown below middle; subterminal line pale, interrupted; terminal line black, interrupted, fringes dark grey mixed with red-brown. Under side grey-brown suffused with fuscous; all the wings have

black discoidal marks and two black transverse lines, the outer line on the fore wings serrated towards costa, and the outer line of hind wings bidentate about middle.

Expanse, 38 millim.

Collection number, 1888.

A male specimen from Arizau, August, 1908.

Bears a resemblance to *B. nigrescens*, Warren.

*Boarmia squalida*, sp. n.

♂. Head, thorax, and abdomen whitish-grey, abdomen mixed with darker grey. Fore wings greyish-white, freckled with darker, a blackish patch at the base divided by the median nervure; antemedial and postmedial lines black, the former bluntly angled about middle, the latter serrated and outwardly edged with white; discoidal lunule black, a blackish cloud above it on the costa; a blackish triangular patch on termen between veins 4 and 7; terminal line blackish, interrupted; fringes white chequered with blackish at ends of the veins. Hind wings greyish white, discoidal spot black; postmedial line blackish, serrated, outwardly edged with whitish; terminal line black, fringes whitish. Under side fuscous, apex of fore wings whitish; transverse lines as above but indistinct.

Expanse, 24 millim.

Collection number, 1695.

A male specimen from Arizan, August, 1908.

Near *B. nigrofasciata*, Leach.

*Ectropis arizanensis*, sp. n.

♂. Head, thorax, and abdomen whitish-brown mixed with darker brown; antennæ brown, fasciculate. Fore wings whitish-brown dusted with darker, costa tinged with ochreous and streaked with blackish; antemedial line blackish, double, inwardly oblique, indented below costa; medial line blackish, indented below costa; curved around end of cell, approximating to postmedial on dorsum; postmedial line blackish, inwardly oblique, indented below costa, slightly bent outwards below the middle, followed by blackish dots on veins 3, 4, 6, 7, and on dorsum; subterminal line pale, inwardly edged with dusky at costa, above middle, and on dorsum; black dots between veins on termen. Hind wings whitish-brown dusted with darker; antemedial line brown, zigzag; discoidal mark brown, lunular; postmedial line brown, dentate and irregular, marked with black below costa and on dorsum, followed by a paler brown line also dentate; subterminal line pale, inwardly shaded with brown; terminal dots black. Under side paler, transverse lines faintly in evidence.

Expanse, 23 millim.

Collection numbers, 787 and 789b.

Two male specimens from Arizan. One (the type) captured on September 8th, 1906, the other on August 6th, 1908.

Comes nearest to *E. dentilineata*, Moore, but the antennæ are different.

*Silabraxas kanshireiensis*, sp. n.

♂. Antennæ not ciliated; head blackish, collar ochreous; thorax whitish, mixed with ochreous and marked with black; abdomen yellow, spotted with black marks, the subdorsal series smaller than the others. Fore wings white, basal patch yellow marked with rusty black and flecked with metallic; antemedial band leaden-grey, broken towards costa; medial group of leaden-grey spots on the costal area; postmedial band leaden-grey, maculate, bifurcate at costa, uniting with a yellow centred and metallic-flecked darker spot near tornus; leaden-grey spots on termen, placed between veins and preceded by larger leaden-grey spots on veins 3 and 4 and some smaller spots nearer the costa. Hind wings white with a large leaden-grey discoidal spot; subterminal series of leaden-grey spots decrease in size towards costa, those at dorsal end black inwardly edged with ochreous and flecked with metallic; terminal spots leaden-grey. Under side similar to above, but without ochreous or metallic scales on dorsal spots.

♀. Fore wings without marking on dorsal half of median area; no discoidal spot on hind wings.

Expanse, 43 millim. ♂; 46 millim. ♀.

Collection number, 650.

One example of each sex from Kanshirei (1000 ft.); the male taken in June, 1906, and the female in April, 1908.

Except difference in antennæ, this species comes nearest to *Abraxas leopardina*, Koll.

*Triphosa arizanensis*, sp. n.

♀. Head and thorax pale brown, darker mixed; abdomen pale brown. Fore wings pale brown with many darker transverse markings; subbasal line blackish-brown, double, wavy; antemedial line black, sinuous, shaded outwardly with blackish-brown; postmedial line black, undulated, bluntly angled below costa and indented before dorsum, inwardly shaded with blackish-brown; middle of space enclosed by antemedial and postmedial lines suffused and clouded with dark brown; discoidal lunule black; subterminal line pale, interrupted, area beyond dark brown; area between postmedial and subterminal lines clouded with darker between veins and traversed by three or four wavy dark lines, the latter thicker and more conspicuous on the costal area, the veins appear to be dotted with pale brown; fringes dark brown, preceded by a black crenulate line. Hind wings pale brown, basal half suffused with fuscous traversed by darker lines; space between the dark line limiting the basal half and the subterminal line traversed by four wavy dark lines; area beyond the subterminal line dark brown; terminal line black, crenulate; fringes dark brown. Under side pale brown suffused with fuscous, markings of upper side faintly visible.

Expanse, 60 millim.

Collection number, 1668.

A female specimen from Arizan, May, 1908.

Closely allied to *T. expansa*, Moore.

(To be continued.)



## NOTES AND OBSERVATIONS.

MIGRATION OF *PYRAMEIS ATALANTA*.—The Bishop of Ripon sends us the following note:—"On September 13th last, I was fishing with Mr. Percival Williams, of Lenarth, and Dr. Leverton-Spy, of St. Keverne, on the south coast of Cornwall, about half a mile off the Blackhead, which lies halfway between Lizard Point and Falmouth. We were moving about, and noticed several 'Red Admirals' flying seaward from the shore. At first we only thought of them as having been by chance driven off shore by the wind, but as we noticed more of them from time to time, and as in all probability the same was occurring beyond our range of vision, say fifty yards, it occurred to Mr. Williams that the question had arisen as to the migration of this butterfly. We must have noticed at least a dozen, not more than twenty, and all of them seemed seaward bound, S. or S.E. The time was between twelve and three, the wind light from the N.W. and off shore, with bright sunshine. On the previous day, Sunday, the wind and weather had been the same, as also on the succeeding days, but for some eight days before there had been a strong and persistent easterly inshore wind, culminating on the Saturday in half a gale. Mr. Williams, who is a resident in the neighbourhood, has never noticed many 'Red Admirals' on the cliffs, but at his home three miles inland there are always quantities in the autumn. None of them attempted to settle on the boat, but continued on their flight, and all in the same south-easterly direction."

*PYRAMEIS ATALANTA* IN 1915.—From my experience of *Pyrameis atalanta* on the south coast this autumn, I cannot help thinking that had Mr. Hugh Scott been able to prolong his stay in the Henley district for two or three weeks longer he would have found the species less rare than would appear from his note (*ante*, p. 266). My own opportunities for observation were confined almost entirely to week-ends, and to little more than a mile of ground almost within the town of Eastbourne; but as they extended over a period from the end of July to November, I was able to note the coming and going of the autumn emergence. The species was not seen at all until quite the end of August, and from then till September 17th only single specimens were noted, but on the 18th several were seen on the parade banks, and in the garden four patches of a species of *Michaelmas daisy* proved a great attraction, anything from three to half a dozen individuals frequently being on each of the patches. A similar state of things continued until October 10th, but on the 17th only three were seen in the garden, and not more than a couple elsewhere. Then followed a week of unsettled weather, and we saw no more of *P. atalanta*.—R. ADKIN; Lewisham, November, 1915.

ABERRATIONS OF *PYRAMEIS ATALANTA*.—For over thirty years I have each season bred up all the larvæ that I could find, averaging from twenty-five to seventy, in the hope of getting a good aberration of this very constant species. I had no success until last year, when I bred one with the bands of a rusty red, those on the fore wings having their edges beautifully clouded instead of being sharply

defined, and those on the hind wings with the spots very large and triangular, the one nearest the angle containing a blue scale. There is also a large patch of blue scales near the centre of the left hind wing. This year I have bred two with the bands bright orange-vermilion and one in which they are ochreous-yellow, this being the most striking colour variation that I have ever seen. I have found that any colour variation is usually the other way towards carmine, and any tendency towards yellow appears to be extremely rare.—MARTIN J. HARDING; Oakdene, Church Stretton, November 17th, 1915.

NAMES OF THE BRITISH SPECIES OF *CHLOROPERLA*.—With reference to my notes in 'The Entomologist' of March, 1913, on two British species of *Chloroperla*, it may be well to state that I subsequently submitted to Professor Klupálek specimens of the insect for which the name of *C. venosa* was provisionally used, and discussed with him the nomenclature employed in the 'Süsswasser-fauna Deutschlands.' As a result, and without going into details at present, it seems to me that our British insect should be called *C. griseipennis*, Pict. As I have already used the latter name in correspondence, I think it is desirable to publish this short note to prevent misunderstanding.—KENNETH J. MORTON; 13, Blackford Road, Edinburgh, November 1st, 1915.

EPERMENIA (CHAULIODUS) ILLIGERELLA, Hb., IN GLOUCESTERSHIRE.—When searching for larvæ of *Earias chlorana* in an osier bed near Gloucester on September 6th last I took two specimens of *Epermenia illigerella*, which does not appear to have been recorded from this county before. Several more specimens were observed, but by September 17th they were worn. They were flying on calm evenings between 6 and 7 p.m., and frequently settled on the osier and buckthorn leaves. It is curious that such a striking Tinea should have hitherto escaped observation in this district. I have to thank Mr. Edward Meyrick, F.R.S., F.E.S., for confirming the identity of this species.—C. GRANVILLE CLUTTERBUCK, F.E.S.; 23, Heathville Road, Gloucester, November 14th, 1915.

ECHINOMYIA GROSSA, L., AND OTHER DIPTERA IN CORNWALL AND DEVON.—After collecting Diptera for over twenty years in Devon and Cornwall, I have at last found a spot where *E. grossa*, the largest British dipteran, is plentiful. In a marshy valley near the sea, about three miles from Tintagel, North Cornwall, I saw as many as twenty on August 19th and 20th this year. On August 23rd I saw one flying quite near King Arthur's Castle at Tintagel. I have three specimens, *ex coll.* Bignell (who probably got them from Rev. T. A. Marshall), labelled as follows:—"Cornworthy, Devon, September, 1888; Botus Fleming, E. Cornwall, 1890; Salcombe, S. Devon, July, 1892." The fable of the dog and the shadow was exemplified when on attempting to get a *grossa* and a *Volucella inanis*, L., with one stroke of the net and missed both! I have not seen or taken *inanis* since 1906, when I took a fine pair at Bovey. I took also with the *grossa* several *Fabricia ferox*, L. This is uncommon here; I have only taken them previously at Bovey, also in 1906. *Echino-*

*myia fera*, L., which resembles it, but is not nearly so handsome, is common in Devon and Cornwall.—C. W. BRACKEN, B.A., F.E.S.; Corporation Grammar School, Plymouth.

GOMPHOCERUS MACULATUS, Thunb., TETRIX SUBULATUS, L., AND CONOCEPHALIS DORSALIS, Latr.—The first-named grasshopper was present in dozens on the slopes of a steep valley at Treborwith, N. Cornwall, last August. The specimens were, almost without exception, of various shades of brown. This species is very local in the south-west and cannot be called common. I have taken it sparingly at Ugborough (S. Devon) and at Lee Woods (N. Devon)—at both these places the insects were nearly all black. *T. bipunctatus* is common everywhere here, but *T. subulatus* rarely occurs. Mr. J. H. Keys has given me one taken at Nodder Bridge, Saltash (near Plymouth, but on Cornish side of Tamar), April 24th, 1915. All my previous captures were made at Bude and Braunton Burrows. After five hours patient sweeping near Churston, S. Devon, on August 26th, 1914, I took three of the rare orthopteron *Conocephalis dorsalis*, Latr., two males and one female. They were captured in exactly the same spot as that in which Mr. G. T. Porritt took them several years ago. It was a pretty sight to see them sunning themselves on the rushes, their antennæ waving like threads of spun glass.—C. W. BRACKEN.

MALPIGHIS GALLS.—I have again taken a few of these rare galls this autumn (October 6th). I can always depend on finding them on one or two trees at Newnham, Plympton, near Plymouth. I took one also at Plym Bridge Woods, October 2nd. The fact may be worth recording, since the late Mr. E. Connold in his 'British Oak Galls' states that he never found but one. I corresponded with him once concerning my specimens, and he agreed they were not *callidoma* but *malpighii*. I find from some memoranda of the late Mr. G. C. Bignell that he took twenty-two of these galls at Bickleigh, near Plymouth, on October 22nd, 1900.—C. W. BRACKEN.

NOTES ON THE EARLY STAGES OF PLUSIA MONETA.—In the 'Entomologist' for 1912 (vol. xlv. pp. 181, 206, 207) several letters appeared relating to the ovipositing and method of hibernation of *Plusia moneta*. The Rev. W. Claxton began by asking in what stage this insect hibernated, and related his experience of finding a larva in the spring which could only have come to him among some seed which he purchased. As *P. moneta* was common in my garden this summer, I spent some time in watching the process of ovipositing, and found the egg was generally laid on the corolla of the flower but sometimes on a leaf. I also captured a few females and enclosed them in muslin bags on the flower-heads. A number of ova were laid, some on the flowers and some on the muslin. These hatched in about a fortnight, and the young larvæ at once ate their way into the young seed-pods, the only visible mark of entry being a tiny hole, or rather not, about the size of a pin's point. Determined to see whether it was possible for the larvæ to hibernate on the seeds alone, I have since then kept the muslin bags *in situ* on the flower



and seed-heads, and on examining them to-day I find several of the larvæ still there and quite healthy and strong. It is evident, therefore, that the larvæ can and do sometimes hibernate in the seeds, and clearly Mr. Claxton's larva came to him among the seeds which he purchased. But I feel equally sure that what usually happens is that the larvæ leave the seed-pods, or get thrown out of them when the ripe seed is discharged, and that they then enter the ground or the root crowns of the plants, and there hibernate. Mr. Nicholson (vol. xlv. p. 206) states that the insect is double-brooded. This may be so in some cases, but I have never known it to be so here, and my young larvæ which were hatched early in July are even now not more than an eighth of an inch long. The colour is dirty white, covered with black spots, and a black head.—PERCY C. REID; Feering Bury, Kelvedon, November 15th, 1915.

INJURY TO THE WINGS OF *LYCÆNA ARION*.—I see by Mr. J. H. Grant's note in the 'Entomologist,' p. 263, that he still is inclined to believe that the injury to the wings of *L. arion* is caused by ants, and adds that he "would like to know if the Cornwall specimens exhibit similar injuries." If the damage was not caused by the means I alluded to (p. 243), as one might suppose from Mr. Grant's statement in his first note (p. 215), that all had similar injuries, it appears hardly likely that it would be the result of either accident or the work of ants. I may say that I have not noticed similar injury to the Cornish *arion*, although I have examined a great number of specimens, considerably over a thousand. There is no butterfly which appears more subject to become injured than *arion*, especially in its Cornish localities, chiefly owing to its habit of taking shelter in furze bushes. From what is known of this butterfly I think the ant theory as regards injury the least likely.—F. W. FROHAWK; November, 1915.

UNRECORDED FOOD-PLANTS OF THE LARVA OF *ORGYIA ANTIQUA*.—In August last I received from a correspondent in Stirling, N.B., a number of eggs, larvæ, and pupæ of *Orgyia antiqua* for identification, together with a note stating that a pond filled with rushes on the moors and surrounded with heather was swarming with the larvæ in "hundreds of thousands" feeding on the rushes, eating them down. Some of the cocoons received were spun up in clusters among the rushes, as well as amongst the heather. I believe this is the first instance known of *antiqua* feeding on rushes and heather. I may add that a large number of minute ichneumon flies emerged from the eggs after they reached me.—F. W. FROHAWK; Nov. 15th, 1915.

RESTING HABIT OF *CÆNONYMPHA TIPHON* (DAVUS).—This is a species best to "mark down." The ground is usually too treacherous for rushing, therefore keep your eye on the spot and advance to it leisurely. The closed wings of the butterfly assimilate in coloration with the surroundings, but the spots on the exposed under side always give it away. This peculiar resting habit has always been familiar to me in *Hipparchia semele*; but I cannot remember ever having seen it in any other of the "Satyrs," excepting *tiphon*. However, it is an interesting point, and it is to be hoped the readers



of the 'Entomologist' will let us hear more of it.—J. ARKLE; Chester.

IRREGULAR EMERGENCE OF OCHRIA (XANTHIA) AURAGO.—I have often noticed a great difference in the period occupied by different species in emerging, but the experience I have had this year with a batch of *O. aurago* is, I think, worthy of record. The ova hatched fairly evenly in the spring, and all the larvæ were treated identically the same as were also the pupæ. The larvæ were protected from cold, and so fed up a trifle more rapidly than they would have in nature. The cocoons were opened on August 7th, when all but five had pupated, and these changed a few days later. The emergencies of the perfect insects were as follows:—August 9th, two; August 14th, one; August 17th, two; August 25th, one; August 28th, one; August 30th, one; September 4th, two; September 6th, two; from this date to September 20th there were daily emergencies varying between four and fifteen per day; September 21st, two; September 22nd, two; September 23rd, one; September 24th, two. Altogether ever eighty-nine per cent. of the pupæ produced imagines. The notable point is that forty-six days elapsed between the first emergence and the last, despite the fact that the hatching of the larvæ did not extend beyond a few days, and that both larvæ and pupæ had exactly similar treatment. With certain of the *Cucullia* and other species, whose larvæ are to be found for weeks in all stages of development, such variation in emergence is of course usual, but it is the first time I have come across such marked irregularity in a species whose early stages are generally more uniform.—C. RIPPON; Springfield House, Abingdon-on-Thames.

CUCULLIA LYCHNITIS.—Referring to Mr. Spiller's notes on this species in the September 'Entomologist,' I have taken *C. lychnitis* larvæ for many years in the Chiltern Hills, and have frequently seen them in the valleys and low-lying parts. In fact, I have usually found them more abundantly in such situations than in higher and more exposed spots. The larvæ undoubtedly love a warm and sunny situation, and do best when the conditions allow them to feed up rapidly; any situation exposed to cold winds would therefore not be so suitable to their increase as more sheltered quarters. As to larvæ of different sizes being found at the same time, that is practically always the same with *lychnitis*; indeed, more than once I have taken larvæ, and a considerable time after they have pupated I have found other larvæ not a quarter of an inch in length. As the larvæ grow, so their food requires to be more substantial, and I have found it unwise in confinement to give the larger larvæ anything except green seed-pods. With reference to Mr. Nicholson's note in the November 'Entomologist,' I may say that I have never found the larvæ of *C. lychnitis* on anything but *Verbascum nigrum*, though I have found them very ready—too ready for their health—to eat white mullein in confinement. Further, in referring to low-lying parts of the Chilterns, I don't mean to imply that the ground was in any sense marshy, quite the contrary, though I have often found *Verbascum nigrum* flourishing in and near ditches, which must be frequently full of water in the winter months.—C. RIPPON.

**THE MACRO-LEPIDOPTERA OF RENFREWSHIRE.**—An annotated list of the Lepidoptera, including the Pyralididæ and Pterophoridaæ, occurring in Renfrewshire is published in 'Transactions of the Paisley Naturalists' Society,' vol. ii. pp. 40-60 (1915). The list has been compiled by Mr. Alex. M. Stewart.

**COLIAS EDUSA, LYCÆNA CORYDON** ab. **SEMISYNGRAPHA**, **HESPERIA MALVÆ** ab. **TARAS** AT BRIGHTON. — With reference to Mr. F. Jay Arnott's report of *C. edusa* in the Dyke Valley, near Brighton, in September, my little daughter, aged twelve, who is a keen entomologist, saw one specimen at the same place on September 3rd. As she assisted me to secure a good number in 1913 she was not likely to be mistaken in the insect. On September 5th, in the same valley, she netted amongst *L. corydon* one ab. *semisyngrapha*. On a former occasion, in another valley, also *H. malvæ* ab. *taras* (*lavateræ*). Knowing the ordinary form of both latter she recognized her catches were unusual, although she was unaware of their rarity. It may be interesting to record that the latter insect was secured in the same short stretch of valley where the late Mr. Neil McArthur took two *L. bœticus* in August, 1859, one of which in later years he showed me. With regard to *C. edusa* I made several excursions last year and this to likely places, but not one did I see.—LOUIS MEADEN; Melbourne House, Dyke Road, Preston, Brighton, October 19th, 1915.

**COLIAS HYALE** NEAR FIRING LINE.—My son has asked me to forward the following note to you for publication:—"To one who has never met with the species before, the sight of half a dozen *Colias hyale* on the wing together near a chalky bank on September 19th, a mile or so behind the firing line, gave great pleasure.—F. NORTON; 11th Welsh Regiment, British Expeditionary Force."

In a previous letter my son referred to the great pleasure he derived from his knowledge and love of natural history, and the relief it afforded him from the tedious monotony of some of his days of training before he proceeded on active service "somewhere in France."—M. A. NORTON; Skirbeck, Whitechurch Road, Cardiff, September 28th, 1915.

**BUTTERFLIES IN THE TRENCHES.**—Mr. Harrold Sims, of the Entomological Society of Montreal, writes on September 21st from Flanders:—"We have had, on the whole, wonderfully fair weather, and some species of Lepidoptera were very common, even in the trenches. Most kinds have disappeared now, though there are still some late-brood specimens of *P. brassicæ*, *rapi*, *napi*, *V. urticae*, *P. atalanta*, *L. icarus*, *C. hyale*. When we first went into the trenches, *P. mægera* was extremely abundant, and flew about actually in the trenches and 'dugouts.' It was quite the commonest butterfly, although all three 'whites' were very common, and in the waste land just behind the firing line I saw many other species, notably *C. hyale*, *C. edusa* (doubtful), *G. rhamni* (doubtful), *urticæ*, *io*, *polychlorus*, *cardui*, *atalanta*, *egeria*, *mæra*, *E. tithonus*, *jurtina*

(doubtful), *C. pamphilus*, *C. phlæas*, *L. icarus*, *bellargus*, *C. argiolus*, *P. machaon*. I saw others but could not with any approach to certainty identify them. This was near Armentiers, but we have since been moved to quite another part of the line."

**SPHINX CONVULVULI IN HAMPSHIRE.**—A very large female specimen of *S. convulvuli* was brought to me on September 19th which was found by some boys on Milford Common. It died shortly after I received it, and owing to rough handling was quite useless for the cabinet. I opened the body and carefully removed the ova and counted them; they numbered rather more than eight hundred. All were well formed, though not much larger than those of *Hemaris fuciformis*, and were of a brilliant emerald green colour. Mr. W. J. Lucas, in his book on 'British Hawk Moths,' p. 69, mentions a *convulvuli* that was found to contain "no less than two hundred and twenty perfect eggs"—the Milford specimen goes one (or rather six hundred) better!—**SYDNEY WHICHER**; Sheen Cottage, Liss, Hants.

**ACHERONTIA ATROPOS IN LINCOLNSHIRE.**—On September 14th last a specimen of *A. atropos* came to light in a kitchen in this town. This is the first record of the imago having occurred in this district, though larvæ and pupæ have occasionally been found.—**F. P. H. BIRTWHISTLE**; Barton-on-Humber.

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## SOCIETIES.

**ENTOMOLOGICAL SOCIETY OF LONDON.**—*Wednesday, October 6th, 1915.*—The Hon. N. Charles Rothschild, M.A., F.Z.S., F.L.S., President, in the chair.—Messrs. Arthur Gibson, Entomological Branch, Dept. of Agriculture, Ottawa, Canada, and Harold Beck Williams, 82, Fife Avenue, Stoke Newington, N., were elected Fellows of the Society.—Capt. Purefoy exhibited young larvæ of *Lycæna arion*, with an accompanying ant.—Dr. Chapman, drawings of various Lycanid larvæ with the Epidiascope.—The Hon. N. C. Rothschild, four specimens of *Chrysophanus dispar*, taken this year in Holland, apparently identical with the extinct British race.—Dr. Chapman, a specimen of a Dipteron, a species of *Nemotelus* (Fam. Stratiomyidæ), which was quite common where the cases of *Luffia ferchaultella* occurred, the cases of *Luffia* being imitated by a spider (*Cyclosa conica*). This Dipteron at rest also closely imitated the *Luffia* cases.—Mr. G. Meade-Waldo, a new aberration of *Euxoa corticea*, Hb., taken in his light-trap at Hever, Kent, in July; the specimen, known as ab. *obsoleta*, shows only the faintest trace of the orbicular and reniform stigmata.—Mr. L. W. Newman, a very long and varied series of *Aplectu nebulosa* and its varieties ab. *robsoni* and *thompsoni* and intermediate forms from a male and female both of the *robsoni* form, the percentages being: *robsoni* (including intermediates) 50 per cent.; typical specimens 26 per cent.; *thompsoni* 24 per cent. Also a series of *Boarmia repandata* var. *conversaria*, from a pairing obtained between a typical light Hunts female crossed with a con-



*versaria* male, every specimen being var. *conversaria* and every one a female.—Mr. E. E. Green, specimens and drawings of a new British Coccid, discovered at Camberley upon grasses in uncultivated meadows, referable to Signoret's genus *Fairmairia* (now known as *Parafairmairia*).—The Rev. F. D. Morice (1) Gynandromorphous *Hylæus* (*Prosopis*) *brevicornis*; (2) *Halictus lævigatus* male. In this specimen there were only two cubital cells in each upper wing, as in *Dufourea*, *Halictoides*, &c.; (3) a larva (in spirit) and numerous imagines—all females—of the Sawfly *Pteroncus* (*Lophyrus*) *sertifera* (= "*Tenthredo pectinata rufa*" of Retzius) with cocoons from which they emerged.—Prof. Poulton said that since the June meeting of the Society he had received several interesting letters and boxes of specimens from Dr. Carpenter, some of which he read and exhibited.—Mr. Donisthorpe, a colony of *Myrmecina graminicola*, Latr., which he had kept in captivity for over five years, his object in showing this colony being to call attention to the number of winged females which had been reared in the nest this summer.—The following papers were read: "Observations Completing an Outline of the Life History of *Lycæna arion*, L.," by T. A. Chapman, M.D., F.Z.S., F.E.S.; "Further Observations on the Last Stage of the Larva of *Lycæna arion*," by F. W. Frohawk, M.B.O.U., F.E.S.; "A Contribution to the Life History of *Agriales escheri*, Hb.," by T. A. Chapman, M.D., F.Z.S., F.E.S.; "On the Early Stages of *Laticlona* (*Lycæna*) *pyrenaica*, Boisd.," by the same; "Notes on the Early Stages of *Scolitantides orion*, Pall.," by the same; "New Lepidoptera from the Schouten Islands," by J. J. Joicey, F.L.S., F.Z.S., F.E.S., and G. Talbot, F.E.S.; "Some New *Parnassii*," by A. Avinoff, F.E.S.; "A New Micropterygid from Australia," by A. Jefferies Turner, M.D., F.E.S.; "Record of some New Species of the Genus *Teracolus* Occurring in the Northern Territories of the Gold Coast, W. Africa," by G. C. Dudgeon, F.E.S.; "*Glossina morsitans*, Westw., some Notes on the Parasitization of its Pupæ," by Hereward C. Dollman, F.E.S.—GEORGE WHEELER, Hon. Sec.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 14th.—Mr. A. E. Tonge, F.E.S., Vice-President, in the chair.—Mr. Sano exhibited a large number of lantern-slides illustrative of the life-history of *Geotrupes stercorarius*, and contributed a series of notes.—Mr. Priske, the seven British species of the genus *Geotrupes*, including a coppery-coloured aberration of *G. stercorarius*.—Mr. Main, cages arranged by himself to watch the method of cell-making by these beetles.—Mr. Newman, a long bred series of *Aplecta nebulosa* from a pairing of v. *robsoni*; of 350 reared 53 per cent. were *robsoni*, 24 per cent. *thompsoni*, and 26 per cent. typical; also a long series of *Boarmia repandata*, the result of crossing a male *conversaria* with female type; most of the brood were reared, every specimen was *conversaria*, and every one a female. Mr. Newman recorded the fact of the ab. *varleyata* of *Abraxas grossulariata* disappearing from a strain which contained it and reappearing after five years.—Mr. P. A. Buxton communicated, from his brother in the Dardanelles, an instance of a bird—a young Butcher-bird—attacking and capturing a large Hawk-moth.—Mr.



Morford, a number of specimens of *Setinia irrorella*, with *S. aurita* and its aberration *ramosa* sent to him by Prof. Morel, N. Italy.—Mr. Ashby, a long series of the rare Buprestid beetle, *Agrilus viridis*, from the New Forest.—Mr. R. Adkin, specimens of *Anthrocera filipendule* reared from Otford pupæ, including an aberration with only five spots on the fore wings, upper side. Mr. Newman recorded a number of similar specimens from near Brighton.

October 25th.—Mr. R. Adkin, F.E.S., in the chair.—Mr. W. J. Lucas read a paper on "British Cockroaches," and exhibited a large number of lantern-slides illustrative of all the indigenous species and those of occasional occurrence. Instances were subsequently given of one species gradually supplanting another.—Mr. P. A. Buxton, a box of Algerian butterflies, and pointed out that the general facies was completely European, *Teracolus nouni* being the sole representative of the really African fauna.—Mr. Sieh, mines of the rare Tineid *Nepticula tilia*, from Dolgelly, in leaves of lime, the trees growing in shady situations near water.—Mr. H. Moore, a living male specimen of the stick-insect, *Linchodes* sp., which was very rarely met with.—Mr. Brooks, specimens of the beautiful blue female of *Plebeius agon*, known as ab. *masseyi* from Kendal; and also an aberration of *Charaas graminis*, with the usual dark submarginal wedges on the fore wing almost obsolete.—Mr. B. S. Williams, aberrations of *Mamestra trifolii* (*chenopodii*), including a pale ochreous grey form, a dark greyish fuscous form, and a reddish ochreous form.—Mr. Bowman, a very dark coloured specimen of *Saturnia carpinii*, with deep red lower wings; and a cocoon of the same species which, from its shape and size, suggested it was a composite one.

November 11th.—Mr. A. E. Gibbs, F.L.S., Vice-President, in the chair.—Mr. R. Adkin, a short-bred series of *Eupithecia castigata*, reared in May from ova laid by a female captured at Beaconsfield in June, 1914. The larvæ fed almost entirely on the flowers of an Alpine plant (*Campanula pusilla*).—H. J. TURNER, Hon. Rep. Sec.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at Royal Institution, Liverpool, October 18th, 1915.—Dr. John Cotton, Vice-President, in the chair.—This being the first meeting of the session, it was as usual devoted to an exhibition of the work of the members during the past season.—Mr. F. N. Pierce exhibited, on behalf of the Rev. J. W. Metcalfe and himself, *Peronea fissurana* and *Halonota littoralana*, two new species of Tortrix discovered by examination of the genitalia, and read descriptions of the species; also *Peronea ferrugana*, with its vars. *tripunctana*, *brachiana*, and *multipunctana* from various localities; a long series of *Stigmonota perlepidana* from near Mold, and *Agrotopus niveus* from Tansor, Northants, where it had been abundant this year.—Mr. A. W. Hughes had from the Mold district a nice series of *Cidaria suffumata*, some specimens with a tendency to extension of the white ground colour, but none of the melanic form; a series of *Triphaena fimbria* from Delamere, one example being of the scarce mahogany-brown form; from the Wye Valley a number of species, including *Vanessa atalanta*, *V. c-album*, and var. *hutchinsoni*, *V. io*, *Thecla w-album*, *Asthena blomeri*, and *Abraaxas sylvata*.—W. R. Wilding showed long

series of the following: *Vanessa cardui* from Barmouth; *Ctenonympha typhon*, *Erebia epiphron*, and *E. æthiops* from Rannoch.—Dr. A. Randell Jackson brought a very interesting exhibit of humble bees and their parasites captured in his garden at Chester, comprising some forty species, and contributed notes.—Mr. H. B. Prince's exhibit contained long series of many local insects, prominent among them being *Bombyx trifolii* from the Lancashire coast; *Lycæna corydon* and var. *semi-syngrapha*, *Vanessa urticae*, several specimens having the usual orange-red colour replaced by fuscous-ochreous; and *Carterocephalus palæmon*.—Mr. Wm. Mansbridge showed *Lycæna ægon*, a series from Witherslack with var. *masseyi*, and one male, in which the orange spots on the under side were dark fuscous-ochreous, while the hind wings on the upper side were slaty-grey; from Simonswood several specimens of *Acronycta leporina* var. *melanocephala*; *Hyria muricata*, moss form, and *Ennychia octomaculata* from Witherslack; *Rhodaria sanguinalis* from Wallasey; *Peronea comparana*, *P. variegana*, and *Depressaria assimilella* from Delamere Forest, the last-named being new to the county list.—Mr. W. G. Clutton sent a box of Micro-Lepidoptera collected in the Burnley District, which contained among the usual common kinds a specimen of *Gelechia scalella* taken at Burnley; this insect is new to the county list, and the record shows an extension of its range toward the North.—WM. MANSBRIDGE, *Hon. Sec.*

THE LONDON NATURAL HISTORY SOCIETY.—*March 2nd, 1915.*—The President, Dr. E. A. Cockayne, M.A., F.R.C.P., F.E.S., in the chair.—Mr. Herbert Loney, of 354, Goswell Road, E.C., was elected a member.—Dr. Cockayne exhibited *Diplococcus intracellularis meningitidis* of Weichselbaum, the organism which produces epidemic cerebrospinal meningitis (spotted fever).—Mr. H. B. Williams, aberrant forms of *Brenthis euphrosyne* and *Argynnis aglaia*.—Mr. A. W. Mera, two cabinet drawers of "fritillaries," including some fine dark forms of *Brenthis selene* and *Argynnis adippe*.

*March 16th, 1915.*—The President in the chair.—Mr. W. H. A. Austen, 102, Knightsbridge, S.W., Prof. F. C. Hopkins, M.A., F.R.C.P., F.R.S., 71, Grange Road, Cambridge, Mr. G. T. Porritt, F.L.S., Eln Lea, Dalton, Huddersfield, and Mr. P. Worsley Wood, M.A., Emmanuel College, Cambridge, were elected members of the Society.—Mr. W. E. King exhibited a gynandromorph of *Hybernia marginaria*, right side female, left side male.—Mr. C. Nicholson, a complete type collection of British social wasps, together with a comprehensive collection of insects of other orders in illustration of a paper read by him on "Parasites, Paying Guests, and Minnies of Wasps."

*April 20th, 1915.*—The President in the chair.—Mr. A. W. Mera exhibited spring insects from Epping Forest, including dark *Phigalia pedaria*, *Apocheima hispidaria*, and *Hybernia leucophaearia*.—Mr. L. W. Newman, larvæ of *Agrotis ashworthii* from Colwyn Bay.—Mr. Newman read a note on the successful wintering out-of-doors of pupæ of *Pyrameis atalanta*, and suggested that all the early (May) imagines seen had passed the winter as pupæ.

*May 18th, 1915.*—The President in the chair.—Mr. H. W. Wood exhibited the larvæ of *Xanthia fulvago* and *lutea*, and pointed out

the obvious distinctions in them, also larvæ of these two species together with larvæ of *X. ocellaris* and *Ochria aurago*, all of which had been reared on the hybrid *Populus serotina*.—Mr. C. B. Heath, a long and very varied series of *Peronea hastiana* from South Wales.—Mr. R. W. Robbins, a female *Pieris napi* with the tips of the fore wings exceptionally black and the veins covered with black scales on the outer margins of all the wings.—Dr. E. A. Cockayne, four gynandrous *Amorpha populi* which he had recently dissected, and read a note on them.—Mr. A. W. Mera, dimorphic pupa cases of *Papilio machaon* and *Satyrus megæra*.—Mr. Riches bred *Apamea unanimes* and *Cymatophora ocularis*.—Mr. Burkill, galls of *Rhabdophaga salicis* and *R. roscaciella*, on *Salix repens* from Esher, and of *Dasyneura sysymbrii* on *Nasturtium amphibium* from Bedford. A paper was read by Mr. A. Sich, F.E.S., on "A Hawthorn Hedge in Middlesex."

June 1st, 1915.—The President, Dr. E. A. Cockayne, M.A., F.R.C.P., F.E.S., in the chair.—Mr. L. W. Newman exhibited a long and varied series of *Pieris napi* from over-wintering Irish pupæ.—Mr. A. W. Mera, dark forms of *Hybernia marginaria* from Epping Forest.—Mr. H. J. Burkill, galls of *Urocystis violæ* on *Viola sylvestris* from Ruislip, *Andricus ramuli* on *Quercus robur* from Esher and Oxshott, *Aphilobia radices* on *Quercus robur* from Staffs and Surrey, and *Eriophyes dispar* on *Populus tremula* from near Claygate.—Dr. Cockayne, galls of *E. tri-radiatus* on *Salix fragilis* from Golder's Green.

June 15th, 1915.—The President in the chair.—Mr. H. J. Burkill of 103, Gresham House, E.C., and Mr. Vernon Stuart of West Hill, Putney, were elected members.—A special exhibition of larvæ was held.—Mr. L. W. Newman showed a large number of larvæ of rare and local species, including *Bombyx trifolii*, *Trichiura cratagi*, *Petaria nubeculosa*, *Teniocampa populeti*, and *Nyssia lapponaria*.—Mr. H. W. Wood, larvæ of *Agriopsis aprilina* and *Dyschorista fissipuncta* from Abbots Wood, all of which were infested with parasitic worms, *Cleora lichenaria*, *Eupithecia abbreviata*, and many others, also nymphs of the Homopteron *Ledra aurita* beaten from oak at Bookham the previous day.—Mr. Mann, *Bombyx neustria* and *Saturnia pavonia*.—Mr. H. B. Williams, *Spilosoma mendica*, *Vanessa urticæ*, *Rumicis phlæas*, and *Gonepteryx rhamni*.—Mr. A. W. Mera, *Miselia oxyacanthæ*, *Nola cucullatella* and others, and ova of *Rumia crategata*.—Mr. C. Nicholson, *Orgyia antiqua*, *Cidaria testata*, and *Euproctis chrysorrhæa*.—Mr. L. J. Tremayne, pupa of *Epinephele jurtina*.—Mr. C. H. Williams exhibited a series of females of *Polyommatus icarus* and a suffused *Anaitis plagiata* with the inner line entirely obsolete.—Mr. H. B. Williams recorded *Brenthis euphrosyne* from Wimbledon Common, and Dr. Cockayne *Abraxas ulmata* from Abingdon on June 5th, a very early date.

September 7th, 1915.—Mr. S. Austen in the chair.—Mr. Bernard Cooper exhibited a fine under side variety of *Lycæna ægon* and a series of *Satyrus semele* from the New Forest, which included some very dark males.—Mr. W. E. King, varieties of *Epinephele jurtina* and *Cænonympha pamphilus*.—Mr. H. J. Burkill, a small midge gall on *Epilobium angustifolium* which had not been hitherto recorded in



Britain.—Mr. C. H. Williams, a long and varied series of *Vanessa urticae*.

September 21st, 1915.—Mr. R. W. Robbins, Vice-President, in the chair.—Mr. E. A. Aris, 9, Oak Avenue, Hornsey, N., and Mr. C. S. Bayne, 7, Trafalgar Square, Chelsea, S.W., were elected members.—Mr. L. B. Hall exhibited a colony of the red spinning mite *Tetranychus lintearius* from gorse bushes on the cliffs of South Devon.—Mr. A. W. Mera, long and very varied series of "Burnets."—Mr. H. J. Burkill, two rare midge galls, *Perrisia salicariae* on *Lythrum salicaria*, and *P. genisticola* on *Genista tinctoria*.

October 5th, 1915.—Mr. L. B. Prout, F.E.S., Vice-President, in the chair.—Mr. A. W. Mera exhibited a cabinet drawer of "Agrotids."—Mr. L. W. Newman, a drawer of *Aplecta nebulosa* bred from ab. *robsoni*, parents and representatives of a brood of *Boarmia repandata* ab. *conversaria* from a male ab. *conversaria* × light Hunts female, and read notes on the results obtained.—Mr. C. H. Heath, a long series of *Plutella dalella* taken on the south border of Durham in August, those in the extensive variation observed in a small wood.—Mr. J. E. Gardner, a similar series from Epping Forest for comparison.—Mr. C. Nicholson, *Lampyrus noctiluca*, *Phylodecta viminalis*, *Creophilus maxillosus*, *Ledra aurita*, *Trisophora vulnerata*, *Dolycoris baccarum*, *Tipula gigantea*, *Ptychoptera contaminata*, *Echinomyia fera*, *Xylota sylvorum*, *Limosina caenosa* bred from a nest of *Vespa germanica*, with a *Phora* from the same nest, identified provisionally by J. E. Collin as *sublugubris* (Wood), *Ammophila campestris*, *Plenus jaculator*, and a worker of *V. vulgaris* which the exhibitor stated was the smallest he had ever seen; attention was called to the disproportionately long antennae.—Mr. H. W. Wood, a short series of *Agrotis vestigialis* ab. *nigra* (Tutt) from Surrey, *Echinomyia grossa* from Aviemore, and *Physocephala rufipes* from a wasp's nest on Box Hill.—Mr. W. E. King, interesting forms of *Thecla rubi* from Horsley, and *He catera serena*, *Dianthæcia conspersa*, *D. carpophaga*, *D. cucubali*, and *D. capsicola* from the same locality.—Mr. L. B. Prout, a box of coast Agrotids mostly from Scotland, including one *A. obelisca* from Stonehaven, a new record for this locality.—Mr. C. H. Williams, varieties of *Agriades corydon*, including abs. *marginata*, *albina*, *fowleri*, *syngrapha*, *semi-syngrapha*, and *obsoleta*.—Dr. G. B. Longstaff, M.D., F.R.C.P., read a paper on "Points to Observe in Common Insects," illustrated by a series of lantern slides from photographs by Mr. Hamm of Oxford.

THE MANCHESTER ENTOMOLOGICAL SOCIETY.—October 6th, 1915.—*Exhibition Evening*.—Mr. R. Tate, Junr., *A. grossulariata* vars., local and from Huddersfield larvæ; *A. ashworthii* and *A. agathina* from Penmaenmawr; *D. mendica* from South Devon.—Mr. J. H. Watson, living specimens and mature laying ova of the great stick insect, *Eurygenema herculanea*, from Java, feeding on evergreen oak.—Mr. W. Mansbridge, *A. leporina* and var. *melanocephala*, *L. ægon*, series of blue females from Westmorland; *E. octomaculalis* and *H. muricata* from Witherslack; *H. sanguinalis* from Wallasey; *P. comparana* and *P. variegana*, series showing variation from Delamere Forest and Speke (Lancs); series of *D. assimilella* from



Delamere.—Mr. L. Nathan, *C. typhon*, *L. ægon*, *D. sanio*, *B. piniaria*, *E. atomaria*, Delamere, June 26th, 1915; series of *D. mendica* from ova from North Wales; *S. carpina* bred from larvæ from Delamere; *S. ocellatus* bred from larvæ from Southport, September, 1914.—Mr. J. H. Shorrocks, specimens of large cochroach, probably *P. americana*.—Mr. B. H. Crabtree, series of *L. ægon* from Witherslack; *A. adippe* and miscellaneous moths taken in the lake district.—Mr. C. F. Johnson, series of *C. typhon* from Delamere, with under sides heavily spotted, two specimens bearing the spots lanceolate instead of round; blue females of *L. ægon* from Witherslack; long series of *X. fulvago* showing a wide variation, bred from willow catkins collected near Chalford; series of *H. elutata* of the small dark form, taken on the moors near Whaley Bridge.—Mr. J. E. Cope, exotic Lucanidæ from Australia, India, &c., including *Lucanus inclinatus*, *Leptenopterus ibex*, *Lamprima ænea*, *Dorcus unicolor*, *Odontolabris delesserti*, &c.

November 3rd, 1915.—Mr. R. Tate, Junr., gave a very interesting account of an entomological holiday spent in June this year at Burntwood, about four miles from Market Drayton. He exhibited a large number of specimens captured, remarking that the majority were Geometræ, and that the other groups were but poorly represented at Burntwood. Butterflies, too, were scarce. The exhibits included series of *M. notata*, *M. hastata*, *E. punctaria*, and *D. falcataria*, also *E. dolobraria*, *A. leporina*, including black vars., *C. fluctuosa*, *M. albiciliata*, *E. heperata*, *L. hexapterata*, *Z. pendularia*, var. *subroseata*.—Mr. Crabtree showed *B. repandata*, var. *conversaria*, light forms from Monkswood and dark forms from the Wye Valley.—Mr. Buckley, *D. capsicola* taken in Anglesea, and *C. davus* from Delamere.—J. E. COPE, Hon. Sec. pro. tem.

## OBITUARY.

WITH much regret we have to record the death of our esteemed publisher, THOMAS PRICHARD NEWMAN, in his seventieth year. As many of our older readers will be aware, the 'Entomologist' was founded by his father, the late Edward Newman, in 1840. Although Thomas Newman hardly inherited a keen interest in, and talent for, natural history, he nevertheless continued to publish our magazine and also the 'Zoologist.' The latter journal was his property at the time of his very sudden decease, although its scientific value, and its association with his father's name, were the only inducements to carry it on. Thomas Newman was a keen and very successful amateur gardener, and his large garden at Haslemere was a most attractive spot at almost all times of the year. He was a member of the Society of Friends and devoted much of his time to furthering the ends of Peace and International Arbitration. The outbreak of the war was a very great grief to him, though he still remained convinced of the ultimate triumph of Peace on Earth, and that his labours were not in vain. He was apparently in the best of health when seized with heart failure on November 10th at Haslemere Station.











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